FGSL

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Chapter 1

Main Page

Interface module for use of GSL from Fortran

Author

R. Bader, T. Schoonjans

Please see the `Related Pages` section for the information about the conventions used in the interface. Examples on how to use the interface are available in the

doc/examples

subdirectory of the source package.

Chapter 2

Introduction

1. Introductory notes:
   - In Fortran code, GSL_∗ must be replaced by FGSL_∗ for each API call, abstract data type, module variables and parameters (with exception of the M_∗ mathematical constants)
   - Some names were changed due to UC/LC aliasing. See the documentation chapter on special functions for details.
   - Intrinsic type matching:
     (a) real(fgsl_double) is used for double precision values
     (b) real(fgsl_float) is used for single precision values
     (c) integer(fgsl_int) for integer
     (d) integer(fgsl_long) for long integer
     (e) integer(fgsl_size_t) for size_t integer
     (f) complex(fgsl_double_complex) for gsl_complex
     (g) character(fgsl_char) for characters
     (h) no value attributes and mostly no pointers in Fortran calls
     (i) unsigned int must be converted to integer(fgsl_long).
     (j) char ∗ results are converted to fixed length strings. Use TRIM.
2. Additional routines:
   - Generic interface fgsl_well_defined for checking status of FGSL objects (which are typically opaque).
   - See api/array.finc for array alignment routines.
   - See api/math.finc for function object constructors.
   - See api/io.finc for I/O related add-ons.
3. Structure of the documentation:
   - type definitions are in the fgsl section of the Modules menu item
   - all API routines are available via the Files menu item
   - additional remarks on the various files are available via the Related Pages menu item
4. Only interfaces from the GSL manual are implemented. The C include files may contain more stuff which may only be meant for internal use, or is not officially documented.
5. Inlining of GSL routines is not possible.
6. Macros are not supported:
   - macro values are replicated as parameters
   - Inf/Nan need to use IEEE_VALUE (if available)

Chapter 3

Comments on vectors and matrices

Please go to api/array.finc for the API documentation. Since array processing is one of the strengths of Fortran, FGSL focuses on leveraging Fortran-style array processing for those GSL routines which require arguments of type `fgsl_vector*` or `fgsl_matrix*`.

Chapter 4

Comments on basis splines

Please go to api/bspline.finc for the API documentation.

Chapter 5

Comments on chebyshev approximation

Please go to api/chebyshev.finc for the API documentation.

Chapter 6

Comments on complex numbers

Please go to api/complex.finc for the API documentation.

Since the Fortran standard provides extensive support for complex numbers, ony those routines for which no Fortran intrinsic is available are mapped in FGSL. Instead of an argument of type `gsl_complex`, a standard Fortran `complex(fgsl_double)` is used for all mapped functions.

Chapter 7

Comments on numerical derivatives

Please go to api/deriv.finc for the API documentation.

Chapter 8

Comments on Hankel transforms

Please go to api/dht.finc for the API documentation.

Chapter 9

Comments on eigensystems

Please go to api/eigen.finc for the API documentation.

Chapter 10

Comments on error handling

Please go to api/error.finc for the API documentation.

The error handling subroutines are available from Fortran, with exception of the macros `GSL_ERROR` and `GSL_ERROR_VAL`. A user-defined error handler can be defined either in C or using a Fortran function with the `bind(c)` attribute. Here is the description of the required interface:

```
subroutine errhand(reason, file, line, errno) bind(c)
   type(c_ptr), value :: reason, file
   integer(c_int), value :: line, errno
end subroutine errhand
```

An object of type `fgsl_error_handler_t` is returned by the constructor `fgsl_error_handler_init(errhand)`, which takes a subroutine with the interface described above as its argument. The subroutine `fgsl_error(reason, file, line, errno)` works in an analogous manner as the C version. If the Fortran preprocessor is supported, it should be possible to use the macros `__FILE__` and `__LINE__` in the above call. Once not needed any more, the error handler object can be deallocated by calling the subroutine `fgsl_error_handler_free` with itself as its only argument. Note that the function `fgsl_strerror` returns a string of length `fgsl_strmax`.

Chapter 11

Comments on fast Fourier transforms

Please go to api/fft.finc for the API documentation.

Chapter 12

Comments on digital filtering

Please go to api/filter.finc for the API documentation.

Chapter 13

Comments on fitting of functions

Please go to api/fit.finc for the API documentation.

Chapter 14

Comments on histograms

Please go to api/histogram.finc for the API documentation.

Chapter 15

Comments on IEEE support

Please go to api/ieee.finc for the API documentation. interaction between the Fortran run time settings and C may lead to unreliable behaviour; for example, setting of IEEE rounding apparently does not always work correctly. Within Fortran, usage of the facilities defined in the intrinsic IEEE modules is the reliable and therefore appropriate method.

Chapter 16

Comments on numerical integration routines

Please go to api/integration.finc for the API documentation.

Chapter 17

Comments on interpolation routines

Please go to api/interp.finc for the API documentation.

Chapter 18

Comments on auxiliary I/O routines

Please go to api/io.finc for the API documentation.

Chapter 19

Comments on linear algebra routines

Please go to api/linalg.finc for the API documentation. Since GSL follows the C convention for ordering of elements, all matrices must be set up and read out transposed.

Chapter 20

Comments on elementary mathematical functions

Please go to api/math.finc for the API documentation. Note that many of the elementary functions are also available as Fortran intrinsics. The file also contains constructors for function objects.

Chapter 21

Comments on minimization routines

Please go to api/min.finc for the API documentation.

Chapter 22

Comments on miscellaneous support routines

Please go to api/misc.finc for the API documentation.

Chapter 23

Comments on monte carlo routines

Please go to api/montecarlo.finc for the API documentation. Note: in GSL 1.13, accessors were also added to GSL. They're slightly different named and have a differing interface from fgsl_monte_∗_?etparams routines already existing in FGSL. To preserve backward compatibility, the FGSL accessors are retained.

Chapter 24

Comments on moving window statistics

Please go to api/movstat.finc for the API documentation.

Chapter 25

Comments on nonlinear least squares fitting

Please go to api/multifit.finc for the API documentation. Legacy interface - api/nlfit.finc should be used instead.

The new interface deals with both "normal" and "large" problems. Please go to api/nlfit.finc for the API documentation.

Chapter 26

Comments on large linear least square systems

Please go to api/multilarge.finc for the API documentation.

Chapter 27

Comments on multidimensional minimization

Please go to api/multimin.finc for the API documentation.

Chapter 28

Comments on multidimensional root finding

Please go to api/multiroots.finc for the API documentation.

Chapter 29

Comments on ntuples

Please go to api/ntuple.finc for the API documentation.

Chapter 30

Comments on ordinary differential equations

Please go to api/ode.finc for the API documentation. Note that the new odeiv2 calls should be used for new code. The legacy odeiv calls are retained for binary compatibility.

Chapter 31

Comments on permutations, combinations and multisets

Please go to api/permutation.finc for the API documentation.

Chapter 32

Comments on polynomials

Please go to api/poly.finc for the API documentation.

Chapter 33

Comments on random numbers

Please go to api/rng.finc for the API documentation.

Chapter 34

Comments on root finding

Please go to api/roots.finc for the API documentation.

Chapter 35

Comments on running statistics

Please go to api/rstat.finc for the API documentation.

Chapter 36

Comments on simulated annealing

Please go to api/siman.finc for the API documentation.

Chapter 37

Comments on sorting

Please go to api/sort.finc for the API documentation.

Chapter 38

Comments on special functions

Please go to api/specfunc.finc for the API documentation.

Functions for which two identical names would result due to LC/UC aliasing have been assigned new names. The name mappings are given in the following table. The additional letters **c** viz **s** are used to denote cylindrical and spherical Bessel functions, respectively.

C name	Fortran name
gsl_sf_bessel_J0	fgsl_sf_bessel_jc0
gsl_sf_bessel_J0_e	fgsl_sf_bessel_jc0_e
gsl_sf_bessel_J1	fgsl_sf_bessel_jc1
gsl_sf_bessel_J1_e	fgsl_sf_bessel_jc1_e
gsl_sf_bessel_Jn	fgsl_sf_bessel_jcn
gsl_sf_bessel_Jn_e	fgsl_sf_bessel_jcn_e
gsl_sf_bessel_Jn_array	fgsl_sf_bessel_jcn_array
gsl_sf_bessel_Y0	fgsl_sf_bessel_yc0
gsl_sf_bessel_Y0_e	fgsl_sf_bessel_yc0_e
gsl_sf_bessel_Y1	fgsl_sf_bessel_yc1
gsl_sf_bessel_Y1_e	fgsl_sf_bessel_yc1_e
gsl_sf_bessel_Yn	fgsl_sf_bessel_ycn
gsl_sf_bessel_Yn_e	fgsl_sf_bessel_ycn_e
gsl_sf_bessel_Yn_array	fgsl_sf_bessel_ycn_array
gsl_sf_bessel_I0	fgsl_sf_bessel_ic0
gsl_sf_bessel_I0_e	fgsl_sf_bessel_ic0_e
gsl_sf_bessel_I1	fgsl_sf_bessel_ic1
gsl_sf_bessel_I1_e	fgsl_sf_bessel_ic1_e
gsl_sf_bessel_In	fgsl_sf_bessel_icn
gsl_sf_bessel_In_e	fgsl_sf_bessel_icn_e
gsl_sf_bessel_In_array	fgsl_sf_bessel_icn_array
gsl_sf_bessel_I0_scaled	fgsl_sf_bessel_ic0_scaled
gsl_sf_bessel_I0_scaled_e	fgsl_sf_bessel_ic0_scaled_e
gsl_sf_bessel_I1_scaled	fgsl_sf_bessel_ic1_scaled
gsl_sf_bessel_I1_scaled_e	fgsl_sf_bessel_ic1_scaled_e
gsl_sf_bessel_In_scaled	fgsl_sf_bessel_icn_scaled
gsl_sf_bessel_In_scaled_e	fgsl_sf_bessel_icn_scaled_e
gsl_sf_bessel_In_scaled_array	fgsl_sf_bessel_icn_scaled_array

C name	Fortran name
gsl_sf_bessel_K0	fgsl_sf_bessel_kc0
gsl_sf_bessel_K0_e	fgsl_sf_bessel_kc0_e
gsl_sf_bessel_K1	fgsl_sf_bessel_kc1
gsl_sf_bessel_K1_e	fgsl_sf_bessel_kc1_e
gsl_sf_bessel_Kn	fgsl_sf_bessel_kcn
gsl_sf_bessel_Kn_e	fgsl_sf_bessel_kcn_e
gsl_sf_bessel_Kn_array	fgsl_sf_bessel_kcn_array
gsl_sf_bessel_K0_scaled	fgsl_sf_bessel_kc0_scaled
gsl_sf_bessel_K0_scaled_e	fgsl_sf_bessel_kc0_scaled_e
gsl_sf_bessel_K1_scaled	fgsl_sf_bessel_kc1_scaled
gsl_sf_bessel_K1_scaled_e	fgsl_sf_bessel_kc1_scaled_e
gsl_sf_bessel_Kn_scaled	fgsl_sf_bessel_kcn_scaled
gsl_sf_bessel_Kn_scaled_e	fgsl_sf_bessel_kcn_scaled_e
gsl_sf_bessel_Kn_scaled_array	fgsl_sf_bessel_kcn_scaled_array
gsl_sf_bessel_j0	fgsl_sf_bessel_js0
gsl_sf_bessel_j0_e	fgsl_sf_bessel_js0_e
gsl_sf_bessel_j1	fgsl_sf_bessel_js1
gsl_sf_bessel_j1_e	fgsl_sf_bessel_js1_e
gsl_sf_bessel_j2	fgsl_sf_bessel_js2
gsl_sf_bessel_j2_e	fgsl_sf_bessel_js2_e
gsl_sf_bessel_jl	fgsl_sf_bessel_jsl
gsl_sf_bessel_jl_e	fgsl_sf_bessel_jsl_e
gsl_sf_bessel_jl_array	fgsl_sf_bessel_jsl_array
gsl_sf_bessel_jl_steed_array	fgsl_sf_bessel_jsl_steed_array
gsl_sf_bessel_y0	fgsl_sf_bessel_ys0
gsl_sf_bessel_y0_e	fgsl_sf_bessel_ys0_e
gsl_sf_bessel_y1	fgsl_sf_bessel_ys1
gsl_sf_bessel_y1_e	fgsl_sf_bessel_ys1_e
gsl_sf_bessel_y2	fgsl_sf_bessel_ys2
gsl_sf_bessel_y2_e	fgsl_sf_bessel_ys2_e
gsl_sf_bessel_yl	fgsl_sf_bessel_ysl
gsl_sf_bessel_yl_e	fgsl_sf_bessel_ysl_e
gsl_sf_bessel_yl_array	fgsl_sf_bessel_ysl_array
gsl_sf_bessel_i0_scaled	fgsl_sf_bessel_is0_scaled
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gsl_sf_bessel_i1_scaled	fgsl_sf_bessel_is1_scaled
gsl_sf_bessel_i1_scaled_e	fgsl_sf_bessel_is1_scaled_e
gsl_sf_bessel_i2_scaled	fgsl_sf_bessel_is2_scaled
gsl_sf_bessel_i2_scaled_e	fgsl_sf_bessel_is2_scaled_e
gsl_sf_bessel_il_scaled	fgsl_sf_bessel_isl_scaled
gsl_sf_bessel_il_scaled_e	fgsl_sf_bessel_isl_scaled_e
gsl_sf_bessel_il_scaled_array	fgsl_sf_bessel_isl_scaled_array
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gsl_sf_bessel_k0_scaled_e	fgsl_sf_bessel_ks0_scaled_e
gsl_sf_bessel_k1_scaled	fgsl_sf_bessel_ks1_scaled
gsl_sf_bessel_k1_scaled_e	fgsl_sf_bessel_ks1_scaled_e
gsl_sf_bessel_k2_scaled	fgsl_sf_bessel_ks2_scaled
gsl_sf_bessel_k2_scaled_e	fgsl_sf_bessel_ks2_scaled_e

C name	Fortran name
gsl_sf_bessel_kl_scaled	fgsl_sf_bessel_ksl_scaled
gsl_sf_bessel_kl_scaled_e	fgsl_sf_bessel_ksl_scaled_e
gsl_sf_bessel_kl_scaled_array	fgsl_sf_bessel_ksl_scaled_array
gsl_sf_bessel_zero_J0	fgsl_sf_bessel_zero_jc0
gsl_sf_bessel_zero_J0_e	fgsl_sf_bessel_zero_jc0_e
gsl_sf_bessel_zero_J1	fgsl_sf_bessel_zero_jc1
gsl_sf_bessel_zero_J1_e	fgsl_sf_bessel_zero_jc1_e
gsl_sf_bessel_zero_Jnu	fgsl_sf_bessel_zero_jcnu
gsl_sf_bessel_zero_Jnu_e	fgsl_sf_bessel_zero_jcnu_e

Chapter 39

on sparse matrix linear algebra

Please go to api/splinalg.finc for the API documentation.

Chapter 40

Comments on sparse matrix routines

Please go to api/spmatrix.finc for the API documentation.

Chapter 41

Comments on statistical functions

Please go to api/statistics.finc for the API documentation.

Chapter 42

Comments on series acceleration

Please go to api/sum_levin.finc for the API documentation.

Chapter 43

Comments on wavelet transforms

Please go to api/wavelet.finc for the API documentation.

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Chapter 47

Module Documentation

47.1 fgsl Module Reference

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- type fgsl_cheb_series
- type fgsl_combination
- type fgsl_dht
- type fgsl_eigen_gen_workspace
- type fgsl_eigen_genherm_workspace
- type fgsl_eigen_genhermv_workspace
- type fgsl_eigen_gensymm_workspace
- type fgsl_eigen_gensymmv_workspace
- type fgsl_eigen_genv_workspace
- type fgsl_eigen_herm_workspace
- type fgsl_eigen_hermv_workspace
- type fgsl_eigen_nonsymm_workspace
- type fgsl_eigen_nonsymmv_workspace
- type fgsl_eigen_symm_workspace
- type fgsl_eigen_symmv_workspace
- type fgsl_error_handler_t
- type fgsl_fft_complex_wavetable
- type fgsl_fft_complex_workspace
- type fgsl_fft_halfcomplex_wavetable
- type fgsl_fft_real_wavetable
- type fgsl_fft_real_workspace
- type fgsl_file
- type fgsl_filter_gaussian_workspace
- type fgsl_filter_impulse_workspace
- type fgsl_filter_median_workspace
- type fgsl_filter_rmedian_workspace
- type fgsl_function
- type fgsl_function_fdf
- type fgsl_histogram
- type fgsl_histogram2d
- type fgsl_histogram2d_pdf
- type fgsl_histogram_pdf

- type fgsl_integration_cquad_workspace
- type fgsl_integration_fixed_workspace
- type fgsl_integration_glfixed_table
- type fgsl_integration_qawo_table
- type fgsl_integration_qaws_table
- type fgsl_integration_romberg_workspace
- type fgsl_integration_workspace
- type fgsl_interp
- type fgsl_interp2d
- type fgsl_interp2d_type
- type fgsl_interp_accel
- type fgsl_interp_type
- type fgsl_matrix
- type fgsl_matrix_complex
- type fgsl_min_fminimizer
- type fgsl_min_fminimizer_type
- type fgsl_mode_t
- type fgsl_monte_function
- type fgsl_monte_miser_state
- type fgsl_monte_plain_state
- type fgsl_monte_vegas_state
- type fgsl_movstat_function

  fgsl_movstat_function interoperates with gsl_movstat_function
- type fgsl_movstat_workspace
- type fgsl_multifit_fdfridge
- type fgsl_multifit_fdfsolver
- type fgsl_multifit_fdfsolver_type
- type fgsl_multifit_fsolver
- type fgsl_multifit_fsolver_type
- type fgsl_multifit_function
- type fgsl_multifit_function_fdf
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- type fgsl_multimin_function
- type fgsl_multimin_function_fdf
- type fgsl_multiroot_fdfsolver
- type fgsl_multiroot_fdfsolver_type
- type fgsl_multiroot_fsolver

- type fgsl_multiroot_fsolver_type
- type fgsl_multiroot_function
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- type fgsl_multiset
- interface fgsl_nlinear_callback
- type fgsl_ntuple
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- type fgsl_odeiv2_driver
- type fgsl_odeiv2_evolve
- type fgsl_odeiv2_step
- type fgsl_odeiv2_step_type
- type fgsl_odeiv2_system
- type fgsl_odeiv_control
- type fgsl_odeiv_control_type
- type fgsl_odeiv_evolve
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- type fgsl_wavelet_type
- type fgsl_wavelet_workspace
- type gsl_complex
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Variables

- integer, parameter, public fgsl_double = c_double
- integer, parameter, public fgsl_double_complex = c_double_complex
- integer, parameter, public fgsl_extended = selected_real_kind(13)
- integer, parameter, public fgsl_float = c_float
- integer, parameter, public fgsl_int = c_int
- integer, parameter, public fgsl_long = c_long
- integer, parameter, public fgsl_size_t = c_size_t
- integer, parameter, public fgsl_char = c_char
- integer, parameter, public fgsl_strmax = 128
- integer, parameter, public fgsl_pathmax = 2048
- character(kind=fgsl_char, len= ∗), parameter, public fgsl_version =PACKAGE_VERSION
- character(kind=fgsl_char, len= ∗), parameter, public fgsl_gslbase =GSL_VERSION
- integer(fgsl_int), parameter, public fgsl_success = 0
- integer(fgsl_int), parameter, public fgsl_failure = -1
- integer(fgsl_int), parameter, public fgsl_continue = -2
- integer(fgsl_int), parameter, public fgsl_edom = 1
- integer(fgsl_int), parameter, public fgsl_erange = 2
- integer(fgsl_int), parameter, public fgsl_efault = 3
- integer(fgsl_int), parameter, public fgsl_einval = 4
- integer(fgsl_int), parameter, public fgsl_efactor = 6
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- integer(fgsl_int), parameter, public fgsl_enomem = 8
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- integer(fgsl_int), parameter, public fgsl_etolx = 30
- integer(fgsl_int), parameter, public fgsl_etolg = 31
- integer(fgsl_int), parameter, public fgsl_eof = 32
- real(fgsl_extended), parameter, public m_e = 2.71828182845904523536028747135_fgsl_extended
- real(fgsl_extended), parameter, public m_log2e = 1.44269504088896340735992468100_fgsl_extended
- real(fgsl_extended), parameter, public m_log10e = 0.43429448190325182765112891892_fgsl_extended
- real(fgsl_extended), parameter, public m_sqrt2 = 1.41421356237309504880168872421_fgsl_extended
- real(fgsl_extended), parameter, public m_sqrt1_2 = 0.70710678118654752440084436210_fgsl_extended
- real(fgsl_extended), parameter, public m_sqrt3 = 1.73205080756887729352744634151_fgsl_extended
- real(fgsl_extended), parameter, public m_pi = 3.14159265358979323846264338328_fgsl_extended

- real(fgsl_extended), parameter, public m_pi_2 = 1.57079632679489661923132169164_fgsl_extended
- real(fgsl_extended), parameter, public m_pi_4 = 0.78539816339744830961566084582_fgsl_extended
- real(fgsl_extended), parameter, public m_sqrtpi = 1.77245385090551602729816748334_fgsl_extended
- real(fgsl_extended), parameter, public m_2_sqrtpi = 1.12837916709551257389615890312_fgsl_extended
- real(fgsl_extended), parameter, public m_1_pi = 0.31830988618379067153776752675_fgsl_extended
- real(fgsl_extended), parameter, public m_2_pi = 0.63661977236758134307553505349_fgsl_extended
- real(fgsl_extended), parameter, public m_ln10 = 2.30258509299404568401799145468_fgsl_extended
- real(fgsl_extended), parameter, public m_ln2 = 0.69314718055994530941723212146_fgsl_extended
- real(fgsl_extended), parameter, public m_lnpi = 1.14472988584940017414342735135_fgsl_extended
- real(fgsl_extended), parameter, public m_euler = 0.57721566490153286060651209008_fgsl_extended
- real(fgsl_double), parameter, public fgsl_const_num_fine_structure = 7.297352533E-3_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_num_avogadro = 6.02214199E23_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_num_yotta = 1e24_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_num_zetta = 1e21_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_num_exa = 1e18_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_num_peta = 1e15_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_num_tera = 1e12_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_num_giga = 1e9_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_num_mega = 1e6_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_num_kilo = 1e3_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_num_milli = 1e-3_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_num_micro = 1e-6_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_num_nano = 1e-9_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_num_pico = 1e-12_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_num_femto = 1e-15_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_num_atto = 1e-18_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_num_zepto = 1e-21_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_num_yocto = 1e-24_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_speed_of_light = 2.99792458e8_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_gravitational_constant = 6.673e-11_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_plancks_constant_h = 6.62606896e-34_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_plancks_constant_hbar = 1.05457162825e-34_fgsl_↩ double
- real(fgsl_double), parameter, public fgsl_const_mksa_astronomical_unit = 1.49597870691e11_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_light_year = 9.46053620707e15_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_parsec = 3.08567758135e16_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_grav_accel = 9.80665e0_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_electron_volt = 1.602176487e-19_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_mass_electron = 9.10938188e-31_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_mass_muon = 1.88353109e-28_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_mass_proton = 1.67262158e-27_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_mass_neutron = 1.67492716e-27_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_rydberg = 2.17987196968e-18_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_boltzmann = 1.3806504e-23_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_bohr_magneton = 9.27400899e-24_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_nuclear_magneton = 5.05078317e-27_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_electron_magnetic_moment = 9.28476362e-24_fgsl↩ _double
- real(fgsl_double), parameter, public fgsl_const_mksa_proton_magnetic_moment = 1.410606633e-26_fgsl↩ _double
- real(fgsl_double), parameter, public fgsl_const_mksa_molar_gas = 8.314472e0_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_standard_gas_volume = 2.2710981e-2_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_minute = 6e1_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_hour = 3.6e3_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_day = 8.64e4_fgsl_double

- real(fgsl_double), parameter, public fgsl_const_mksa_week = 6.048e5_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_inch = 2.54e-2_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_foot = 3.048e-1_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_yard = 9.144e-1_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_mile = 1.609344e3_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_nautical_mile = 1.852e3_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_fathom = 1.8288e0_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_mil = 2.54e-5_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_point = 3.52777777778e-4_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_texpoint = 3.51459803515e-4_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_micron = 1e-6_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_angstrom = 1e-10_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_hectare = 1e4_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_acre = 4.04685642241e3_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_barn = 1e-28_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_liter = 1e-3_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_us_gallon = 3.78541178402e-3_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_quart = 9.46352946004e-4_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_pint = 4.73176473002e-4_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_cup = 2.36588236501e-4_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_fluid_ounce = 2.95735295626e-5_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_tablespoon = 1.47867647813e-5_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_teaspoon = 4.92892159375e-6_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_canadian_gallon = 4.54609e-3_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_uk_gallon = 4.546092e-3_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_miles_per_hour = 4.4704e-1_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_kilometers_per_hour = 2.77777777778e-1_fgsl_↩ double
- real(fgsl_double), parameter, public fgsl_const_mksa_knot = 5.14444444444e-1_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_pound_mass = 4.5359237e-1_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_ounce_mass = 2.8349523125e-2_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_ton = 9.0718474e2_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_metric_ton = 1e3_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_uk_ton = 1.0160469088e3_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_troy_ounce = 3.1103475e-2_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_carat = 2e-4_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_unified_atomic_mass = 1.660538782e-27_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_gram_force = 9.80665e-3_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_pound_force = 4.44822161526e0_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_kilopound_force = 4.44822161526e3_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_poundal = 1.38255e-1_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_calorie = 4.1868e0_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_btu = 1.05505585262e3_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_therm = 1.05506e8_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_horsepower = 7.457e2_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_bar = 1e5_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_std_atmosphere = 1.01325e5_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_torr = 1.33322368421e2_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_meter_of_mercury = 1.33322368421e5_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_inch_of_mercury = 3.38638815789e3_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_inch_of_water = 2.490889e2_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_psi = 6.89475729317e3_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_poise = 1e-1_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_stokes = 1e-4_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_faraday = 9.64853429775e4_fgsl_double

- real(fgsl_double), parameter, public fgsl_const_mksa_electron_charge = 1.602176487e-19_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_gauss = 1e-4_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_stilb = 1e4_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_lumen = 1e0_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_lux = 1e0_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_phot = 1e4_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_footcandle = 1.076e1_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_lambert = 1e4_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_footlambert = 1.07639104e1_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_curie = 3.7e10_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_roentgen = 2.58e-4_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_rad = 1e-2_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_solar_mass = 1.98892e30_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_bohr_radius = 5.291772083e-11_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_newton = 1e0_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_dyne = 1e-5_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_joule = 1e0_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_erg = 1e-7_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_stefan_boltzmann_constant = 5.67040047374e-8_↩ fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_thomson_cross_section = 6.65245893699e-29_fgsl↩ _double
- real(fgsl_double), parameter, public fgsl_const_mksa_vacuum_permittivity = 8.854187817e-12_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_mksa_vacuum_permeability = 1.25663706144e-6_fgsl_↩ double
- real(fgsl_double), parameter, public fgsl_const_mksa_debye = 3.33564095198e-30_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_speed_of_light = 2.99792458e10_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_gravitational_constant = 6.673e-8_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_plancks_constant_h = 6.62606896e-27_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_plancks_constant_hbar = 1.05457162825e-27_fgsl_↩ double
- real(fgsl_double), parameter, public fgsl_const_cgsm_astronomical_unit = 1.49597870691e13_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_light_year = 9.46053620707e17_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_parsec = 3.08567758135e18_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_grav_accel = 9.80665e2_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_electron_volt = 1.602176487e-12_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_mass_electron = 9.10938188e-28_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_mass_muon = 1.88353109e-25_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_mass_proton = 1.67262158e-24_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_mass_neutron = 1.67492716e-24_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_rydberg = 2.17987196968e-11_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_boltzmann = 1.3806504e-16_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_bohr_magneton = 9.27400899e-21_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_nuclear_magneton = 5.05078317e-24_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_electron_magnetic_moment = 9.28476362e-21_fgsl↩ _double
- real(fgsl_double), parameter, public fgsl_const_cgsm_proton_magnetic_moment = 1.410606633e-23_fgsl↩ _double
- real(fgsl_double), parameter, public fgsl_const_cgsm_molar_gas = 8.314472e7_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_standard_gas_volume = 2.2710981e4_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_minute = 6e1_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_hour = 3.6e3_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_day = 8.64e4_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_week = 6.048e5_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_inch = 2.54e0_fgsl_double

- real(fgsl_double), parameter, public fgsl_const_cgsm_foot = 3.048e1_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_yard = 9.144e1_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_mile = 1.609344e5_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_nautical_mile = 1.852e5_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_fathom = 1.8288e2_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_mil = 2.54e-3_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_point = 3.52777777778e-2_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_texpoint = 3.51459803515e-2_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_micron = 1e-4_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_angstrom = 1e-8_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_hectare = 1e8_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_acre = 4.04685642241e7_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_barn = 1e-24_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_liter = 1e3_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_us_gallon = 3.78541178402e3_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_quart = 9.46352946004e2_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_pint = 4.73176473002e2_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_cup = 2.36588236501e2_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_fluid_ounce = 2.95735295626e1_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_tablespoon = 1.47867647813e1_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_teaspoon = 4.92892159375e0_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_canadian_gallon = 4.54609e3_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_uk_gallon = 4.546092e3_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_miles_per_hour = 4.4704e1_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_kilometers_per_hour = 2.77777777778e1_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_knot = 5.14444444444e1_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_pound_mass = 4.5359237e2_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_ounce_mass = 2.8349523125e1_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_ton = 9.0718474e5_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_metric_ton = 1e6_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_uk_ton = 1.0160469088e6_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_troy_ounce = 3.1103475e1_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_carat = 2e-1_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_unified_atomic_mass = 1.660538782e-24_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_gram_force = 9.80665e2_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_pound_force = 4.44822161526e5_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_kilopound_force = 4.44822161526e8_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_poundal = 1.38255e4_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_calorie = 4.1868e7_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_btu = 1.05505585262e10_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_therm = 1.05506e15_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_horsepower = 7.457e9_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_bar = 1e6_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_std_atmosphere = 1.01325e6_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_torr = 1.33322368421e3_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_meter_of_mercury = 1.33322368421e6_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_inch_of_mercury = 3.38638815789e4_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_inch_of_water = 2.490889e3_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_psi = 6.89475729317e4_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_poise = 1e0_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_stokes = 1e0_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_faraday = 9.64853429775e3_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_electron_charge = 1.602176487e-20_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_gauss = 1e0_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_stilb = 1e0_fgsl_double

- real(fgsl_double), parameter, public fgsl_const_cgsm_lumen = 1e0_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_lux = 1e-4_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_phot = 1e0_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_footcandle = 1.076e-3_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_lambert = 1e0_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_footlambert = 1.07639104e-3_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_curie = 3.7e10_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_roentgen = 2.58e-8_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_rad = 1e2_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_solar_mass = 1.98892e33_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_bohr_radius = 5.291772083e-9_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_newton = 1e5_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_dyne = 1e0_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_joule = 1e7_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_erg = 1e0_fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_stefan_boltzmann_constant = 5.67040047374e-5_↩ fgsl_double
- real(fgsl_double), parameter, public fgsl_const_cgsm_thomson_cross_section = 6.65245893699e-25_fgsl↩ _double
- type(fgsl_mode_t), parameter, public fgsl_prec_double = fgsl_mode_t(0)
- type(fgsl_mode_t), parameter, public fgsl_prec_single = fgsl_mode_t(1)
- type(fgsl_mode_t), parameter, public fgsl_prec_approx = fgsl_mode_t(2)
- type(fgsl_sf_legendre_t), parameter, public fgsl_sf_legendre_schmidt = fgsl_sf_legendre_t(0)
- type(fgsl_sf_legendre_t), parameter, public fgsl_sf_legendre_spharm = fgsl_sf_legendre_t(1)
- type(fgsl_sf_legendre_t), parameter, public fgsl_sf_legendre_full = fgsl_sf_legendre_t(2)
- type(fgsl_sf_legendre_t), parameter, public fgsl_sf_legendre_none = fgsl_sf_legendre_t(3)
- integer(fgsl_int), parameter, public gsl_sf_legendre_schmidt = 0
- integer(fgsl_int), parameter, public gsl_sf_legendre_spharm = 1
- integer(fgsl_int), parameter, public gsl_sf_legendre_full = 2
- integer(fgsl_int), parameter, public gsl_sf_legendre_none = 3
- type(fgsl_multilarge_linear_type), parameter, public fgsl_multilarge_linear_normal = fgsl_multilarge_linear_type(1)
- type(fgsl_multilarge_linear_type), parameter, public fgsl_multilarge_linear_tsqr = fgsl_multilarge_linear_type(2)
- type(fgsl_interp_type), parameter, public fgsl_interp_linear = fgsl_interp_type(1)
- type(fgsl_interp_type), parameter, public fgsl_interp_polynomial = fgsl_interp_type(2)
- type(fgsl_interp_type), parameter, public fgsl_interp_cspline = fgsl_interp_type(3)
- type(fgsl_interp_type), parameter, public fgsl_interp_cspline_periodic = fgsl_interp_type(4)
- type(fgsl_interp_type), parameter, public fgsl_interp_akima = fgsl_interp_type(5)
- type(fgsl_interp_type), parameter, public fgsl_interp_akima_periodic = fgsl_interp_type(6)
- type(fgsl_interp_type), parameter, public fgsl_interp_steffen = fgsl_interp_type(7)
- type(fgsl_interp2d_type), parameter, public fgsl_interp2d_bilinear = fgsl_interp2d_type(1)
- type(fgsl_interp2d_type), parameter, public fgsl_interp2d_bicubic = fgsl_interp2d_type(2)
- type(fgsl_multifit_robust_type), parameter, public fgsl_multifit_robust_default = fgsl_multifit_robust_type(1)
- type(fgsl_multifit_robust_type), parameter, public fgsl_multifit_robust_bisquare = fgsl_multifit_robust_type(2)
- type(fgsl_multifit_robust_type), parameter, public fgsl_multifit_robust_cauchy = fgsl_multifit_robust_type(3)
- type(fgsl_multifit_robust_type), parameter, public fgsl_multifit_robust_fair = fgsl_multifit_robust_type(4)
- type(fgsl_multifit_robust_type), parameter, public fgsl_multifit_robust_huber = fgsl_multifit_robust_type(5)
- type(fgsl_multifit_robust_type), parameter, public fgsl_multifit_robust_ols = fgsl_multifit_robust_type(6)
- type(fgsl_multifit_robust_type), parameter, public fgsl_multifit_robust_welsch = fgsl_multifit_robust_type(7)
- integer(c_int), parameter, public fgsl_eigen_sort_val_asc = 0
- integer(c_int), parameter, public fgsl_eigen_sort_val_desc = 1
- integer(c_int), parameter, public fgsl_eigen_sort_abs_asc = 2
- integer(c_int), parameter, public fgsl_eigen_sort_abs_desc = 3
- integer(fgsl_int), parameter, public fgsl_integ_gauss15 = 1
- integer(fgsl_int), parameter, public fgsl_integ_gauss21 = 2
- integer(fgsl_int), parameter, public fgsl_integ_gauss31 = 3

- integer(fgsl_int), parameter, public fgsl_integ_gauss41 = 4
- integer(fgsl_int), parameter, public fgsl_integ_gauss51 = 5
- integer(fgsl_int), parameter, public fgsl_integ_gauss61 = 6
- integer(fgsl_int), parameter, public fgsl_integ_cosine = 0
- integer(fgsl_int), parameter, public fgsl_integ_sine = 1
- integer(fgsl_int), parameter, public fgsl_integration_fixed_legendre = 1
- integer(fgsl_int), parameter, public fgsl_integration_fixed_chebyshev = 2
- integer(fgsl_int), parameter, public fgsl_integration_fixed_gegenbauer = 3
- integer(fgsl_int), parameter, public fgsl_integration_fixed_jacobi = 4
- integer(fgsl_int), parameter, public fgsl_integration_fixed_laguerre = 5
- integer(fgsl_int), parameter, public fgsl_integration_fixed_hermite = 6
- integer(fgsl_int), parameter, public fgsl_integration_fixed_exponential = 7
- integer(fgsl_int), parameter, public fgsl_integration_fixed_rational = 8
- integer(fgsl_int), parameter, public fgsl_integration_fixed_chebyshev2 = 9
- type(fgsl_rng_type), public fgsl_rng_default = fgsl_rng_type(c_null_ptr, -1)
- type(fgsl_rng_type), public fgsl_rng_borosh13 = fgsl_rng_type(c_null_ptr, 1)
- type(fgsl_rng_type), public fgsl_rng_coveyou = fgsl_rng_type(c_null_ptr, 2)
- type(fgsl_rng_type), public fgsl_rng_cmrg = fgsl_rng_type(c_null_ptr, 3)
- type(fgsl_rng_type), public fgsl_rng_fishman18 = fgsl_rng_type(c_null_ptr, 4)
- type(fgsl_rng_type), public fgsl_rng_fishman20 = fgsl_rng_type(c_null_ptr, 5)
- type(fgsl_rng_type), public fgsl_rng_fishman2x = fgsl_rng_type(c_null_ptr, 6)
- type(fgsl_rng_type), public fgsl_rng_gfsr4 = fgsl_rng_type(c_null_ptr, 7)
- type(fgsl_rng_type), public fgsl_rng_knuthran = fgsl_rng_type(c_null_ptr, 8)
- type(fgsl_rng_type), public fgsl_rng_knuthran2 = fgsl_rng_type(c_null_ptr, 9)
- type(fgsl_rng_type), public fgsl_rng_lecuyer21 = fgsl_rng_type(c_null_ptr, 10)
- type(fgsl_rng_type), public fgsl_rng_minstd = fgsl_rng_type(c_null_ptr, 11)
- type(fgsl_rng_type), public fgsl_rng_mrg = fgsl_rng_type(c_null_ptr, 12)
- type(fgsl_rng_type), public fgsl_rng_mt19937 = fgsl_rng_type(c_null_ptr, 13)
- type(fgsl_rng_type), public fgsl_rng_mt19937_1999 = fgsl_rng_type(c_null_ptr, 14)
- type(fgsl_rng_type), public fgsl_rng_mt19937_1998 = fgsl_rng_type(c_null_ptr, 15)
- type(fgsl_rng_type), public fgsl_rng_r250 = fgsl_rng_type(c_null_ptr, 16)
- type(fgsl_rng_type), public fgsl_rng_ran0 = fgsl_rng_type(c_null_ptr, 17)
- type(fgsl_rng_type), public fgsl_rng_ran1 = fgsl_rng_type(c_null_ptr, 18)
- type(fgsl_rng_type), public fgsl_rng_ran2 = fgsl_rng_type(c_null_ptr, 19)
- type(fgsl_rng_type), public fgsl_rng_ran3 = fgsl_rng_type(c_null_ptr, 20)
- type(fgsl_rng_type), public fgsl_rng_rand = fgsl_rng_type(c_null_ptr, 21)
- type(fgsl_rng_type), public fgsl_rng_rand48 = fgsl_rng_type(c_null_ptr, 22)
- type(fgsl_rng_type), public fgsl_rng_random128_bsd = fgsl_rng_type(c_null_ptr, 23)
- type(fgsl_rng_type), public fgsl_rng_random128_glibc2 = fgsl_rng_type(c_null_ptr, 24)
- type(fgsl_rng_type), public fgsl_rng_random128_libc5 = fgsl_rng_type(c_null_ptr, 25)
- type(fgsl_rng_type), public fgsl_rng_random256_bsd = fgsl_rng_type(c_null_ptr, 26)
- type(fgsl_rng_type), public fgsl_rng_random256_glibc2 = fgsl_rng_type(c_null_ptr, 27)
- type(fgsl_rng_type), public fgsl_rng_random256_libc5 = fgsl_rng_type(c_null_ptr, 28)
- type(fgsl_rng_type), public fgsl_rng_random32_bsd = fgsl_rng_type(c_null_ptr, 29)
- type(fgsl_rng_type), public fgsl_rng_random32_glibc2 = fgsl_rng_type(c_null_ptr, 30)
- type(fgsl_rng_type), public fgsl_rng_random32_libc5 = fgsl_rng_type(c_null_ptr, 31)
- type(fgsl_rng_type), public fgsl_rng_random64_bsd = fgsl_rng_type(c_null_ptr, 32)
- type(fgsl_rng_type), public fgsl_rng_random64_glibc2 = fgsl_rng_type(c_null_ptr, 33)
- type(fgsl_rng_type), public fgsl_rng_random64_libc5 = fgsl_rng_type(c_null_ptr, 34)
- type(fgsl_rng_type), public fgsl_rng_random8_bsd = fgsl_rng_type(c_null_ptr, 35)
- type(fgsl_rng_type), public fgsl_rng_random8_glibc2 = fgsl_rng_type(c_null_ptr, 36)
- type(fgsl_rng_type), public fgsl_rng_random8_libc5 = fgsl_rng_type(c_null_ptr, 37)
- type(fgsl_rng_type), public fgsl_rng_random_bsd = fgsl_rng_type(c_null_ptr, 38)
- type(fgsl_rng_type), public fgsl_rng_random_glibc2 = fgsl_rng_type(c_null_ptr, 39)
- type(fgsl_rng_type), public fgsl_rng_random_libc5 = fgsl_rng_type(c_null_ptr, 40)

- type(fgsl_rng_type), public fgsl_rng_randu = fgsl_rng_type(c_null_ptr, 41)
- type(fgsl_rng_type), public fgsl_rng_ranf = fgsl_rng_type(c_null_ptr, 42)
- type(fgsl_rng_type), public fgsl_rng_ranlux = fgsl_rng_type(c_null_ptr, 43)
- type(fgsl_rng_type), public fgsl_rng_ranlux389 = fgsl_rng_type(c_null_ptr, 44)
- type(fgsl_rng_type), public fgsl_rng_ranlxd1 = fgsl_rng_type(c_null_ptr, 45)
- type(fgsl_rng_type), public fgsl_rng_ranlxd2 = fgsl_rng_type(c_null_ptr, 46)
- type(fgsl_rng_type), public fgsl_rng_ranlxs0 = fgsl_rng_type(c_null_ptr, 47)
- type(fgsl_rng_type), public fgsl_rng_ranlxs1 = fgsl_rng_type(c_null_ptr, 48)
- type(fgsl_rng_type), public fgsl_rng_ranlxs2 = fgsl_rng_type(c_null_ptr, 49)
- type(fgsl_rng_type), public fgsl_rng_ranmar = fgsl_rng_type(c_null_ptr, 50)
- type(fgsl_rng_type), public fgsl_rng_slatec = fgsl_rng_type(c_null_ptr, 51)
- type(fgsl_rng_type), public fgsl_rng_taus = fgsl_rng_type(c_null_ptr, 52)
- type(fgsl_rng_type), public fgsl_rng_taus2 = fgsl_rng_type(c_null_ptr, 53)
- type(fgsl_rng_type), public fgsl_rng_taus113 = fgsl_rng_type(c_null_ptr, 54)
- type(fgsl_rng_type), public fgsl_rng_transputer = fgsl_rng_type(c_null_ptr, 55)
- type(fgsl_rng_type), public fgsl_rng_tt800 = fgsl_rng_type(c_null_ptr, 56)
- type(fgsl_rng_type), public fgsl_rng_uni = fgsl_rng_type(c_null_ptr, 57)
- type(fgsl_rng_type), public fgsl_rng_uni32 = fgsl_rng_type(c_null_ptr, 58)
- type(fgsl_rng_type), public fgsl_rng_vax = fgsl_rng_type(c_null_ptr, 59)
- type(fgsl_rng_type), public fgsl_rng_waterman14 = fgsl_rng_type(c_null_ptr, 60)
- type(fgsl_rng_type), public fgsl_rng_zuf = fgsl_rng_type(c_null_ptr, 61)
- type(fgsl_rng_type), public fgsl_rng_knuthran2002 = fgsl_rng_type(c_null_ptr, 62)
- integer(fgsl_long), bind(C, name='gsl_rng_default_seed'), public fgsl_rng_default_seed
- type(fgsl_qrng_type), parameter, public fgsl_qrng_niederreiter_2 = fgsl_qrng_type(1)
- type(fgsl_qrng_type), parameter, public fgsl_qrng_sobol = fgsl_qrng_type(2)
- type(fgsl_qrng_type), parameter, public fgsl_qrng_halton = fgsl_qrng_type(3)
- type(fgsl_qrng_type), parameter, public fgsl_qrng_reversehalton = fgsl_qrng_type(4)
- integer(c_int), parameter, public fgsl_vegas_mode_importance = 1
- integer(c_int), parameter, public fgsl_vegas_mode_importance_only = 0
- integer(c_int), parameter, public fgsl_vegas_mode_stratified = -1
- type(fgsl_odeiv2_step_type), parameter, public fgsl_odeiv2_step_rk2 = fgsl_odeiv2_step_type(1)
- type(fgsl_odeiv2_step_type), parameter, public fgsl_odeiv2_step_rk4 = fgsl_odeiv2_step_type(2)
- type(fgsl_odeiv2_step_type), parameter, public fgsl_odeiv2_step_rkf45 = fgsl_odeiv2_step_type(3)
- type(fgsl_odeiv2_step_type), parameter, public fgsl_odeiv2_step_rkck = fgsl_odeiv2_step_type(4)
- type(fgsl_odeiv2_step_type), parameter, public fgsl_odeiv2_step_rk8pd = fgsl_odeiv2_step_type(5)
- type(fgsl_odeiv2_step_type), parameter, public fgsl_odeiv2_step_rk1imp = fgsl_odeiv2_step_type(6)
- type(fgsl_odeiv2_step_type), parameter, public fgsl_odeiv2_step_rk2imp = fgsl_odeiv2_step_type(7)
- type(fgsl_odeiv2_step_type), parameter, public fgsl_odeiv2_step_rk4imp = fgsl_odeiv2_step_type(8)
- type(fgsl_odeiv2_step_type), parameter, public fgsl_odeiv2_step_bsimp = fgsl_odeiv2_step_type(9)
- type(fgsl_odeiv2_step_type), parameter, public fgsl_odeiv2_step_msadams = fgsl_odeiv2_step_type(10)
- type(fgsl_odeiv2_step_type), parameter, public fgsl_odeiv2_step_msbdf = fgsl_odeiv2_step_type(11)
- type(fgsl_odeiv_step_type), parameter, public fgsl_odeiv_step_rk2 = fgsl_odeiv_step_type(1)
- type(fgsl_odeiv_step_type), parameter, public fgsl_odeiv_step_rk4 = fgsl_odeiv_step_type(2)
- type(fgsl_odeiv_step_type), parameter, public fgsl_odeiv_step_rkf45 = fgsl_odeiv_step_type(3)
- type(fgsl_odeiv_step_type), parameter, public fgsl_odeiv_step_rkck = fgsl_odeiv_step_type(4)
- type(fgsl_odeiv_step_type), parameter, public fgsl_odeiv_step_rk8pd = fgsl_odeiv_step_type(5)
- type(fgsl_odeiv_step_type), parameter, public fgsl_odeiv_step_rk2imp = fgsl_odeiv_step_type(6)
- type(fgsl_odeiv_step_type), parameter, public fgsl_odeiv_step_rk2simp = fgsl_odeiv_step_type(7)
- type(fgsl_odeiv_step_type), parameter, public fgsl_odeiv_step_rk4imp = fgsl_odeiv_step_type(8)
- type(fgsl_odeiv_step_type), parameter, public fgsl_odeiv_step_bsimp = fgsl_odeiv_step_type(9)
- type(fgsl_odeiv_step_type), parameter, public fgsl_odeiv_step_gear1 = fgsl_odeiv_step_type(10)
- type(fgsl_odeiv_step_type), parameter, public fgsl_odeiv_step_gear2 = fgsl_odeiv_step_type(11)
- integer(fgsl_int), parameter, public fgsl_odeiv_hadj_inc = 1
- integer(fgsl_int), parameter, public fgsl_odeiv_hadj_nil = 0
- integer(fgsl_int), parameter, public fgsl_odeiv_hadj_dec = -1

- type(fgsl_wavelet_type), parameter, public fgsl_wavelet_daubechies = fgsl_wavelet_type(1)
- type(fgsl_wavelet_type), parameter, public fgsl_wavelet_daubechies_centered = fgsl_wavelet_type(2)
- type(fgsl_wavelet_type), parameter, public fgsl_wavelet_haar = fgsl_wavelet_type(3)
- type(fgsl_wavelet_type), parameter, public fgsl_wavelet_haar_centered = fgsl_wavelet_type(4)
- type(fgsl_wavelet_type), parameter, public fgsl_wavelet_bspline = fgsl_wavelet_type(5)
- type(fgsl_wavelet_type), parameter, public fgsl_wavelet_bspline_centered = fgsl_wavelet_type(6)
- type(fgsl_root_fsolver_type), parameter, public fgsl_root_fsolver_bisection = fgsl_root_fsolver_type(1)
- type(fgsl_root_fsolver_type), parameter, public fgsl_root_fsolver_brent = fgsl_root_fsolver_type(2)
- type(fgsl_root_fsolver_type), parameter, public fgsl_root_fsolver_falsepos = fgsl_root_fsolver_type(3)
- type(fgsl_root_fdfsolver_type), parameter, public fgsl_root_fdfsolver_newton = fgsl_root_fdfsolver_type(1)
- type(fgsl_root_fdfsolver_type), parameter, public fgsl_root_fdfsolver_secant = fgsl_root_fdfsolver_type(2)
- type(fgsl_root_fdfsolver_type), parameter, public fgsl_root_fdfsolver_steffenson = fgsl_root_fdfsolver_type(3)
- type(fgsl_min_fminimizer_type), parameter, public fgsl_min_fminimizer_goldensection = fgsl_min_fminimizer_type(1)
- type(fgsl_min_fminimizer_type), parameter, public fgsl_min_fminimizer_brent = fgsl_min_fminimizer_type(2)
- type(fgsl_min_fminimizer_type), parameter, public fgsl_min_fminimizer_quad_golden = fgsl_min_fminimizer_type(3)
- type(fgsl_multiroot_fsolver_type), parameter, public fgsl_multiroot_fsolver_dnewton = fgsl_multiroot_fsolver_type(1)
- type(fgsl_multiroot_fsolver_type), parameter, public fgsl_multiroot_fsolver_broyden = fgsl_multiroot_fsolver_type(2)
- type(fgsl_multiroot_fsolver_type), parameter, public fgsl_multiroot_fsolver_hybrid = fgsl_multiroot_fsolver_type(3)
- type(fgsl_multiroot_fsolver_type), parameter, public fgsl_multiroot_fsolver_hybrids = fgsl_multiroot_fsolver_type(4)
- type(fgsl_multiroot_fdfsolver_type), parameter, public fgsl_multiroot_fdfsolver_newton = fgsl_multiroot_fdfsolver_type(1)
- type(fgsl_multiroot_fdfsolver_type), parameter, public fgsl_multiroot_fdfsolver_gnewton = fgsl_multiroot_fdfsolver_type(2)
- type(fgsl_multiroot_fdfsolver_type), parameter, public fgsl_multiroot_fdfsolver_hybridj = fgsl_multiroot_fdfsolver_type(3)
- type(fgsl_multiroot_fdfsolver_type), parameter, public fgsl_multiroot_fdfsolver_hybridsj = fgsl_multiroot_fdfsolver_type(4)
- type(fgsl_multimin_fminimizer_type), parameter, public fgsl_multimin_fminimizer_nmsimplex = fgsl_multimin_fminimizer_type(1
- type(fgsl_multimin_fminimizer_type), parameter, public fgsl_multimin_fminimizer_nmsimplex2 = fgsl_multimin_fminimizer_type(
- type(fgsl_multimin_fminimizer_type), parameter, public fgsl_multimin_fminimizer_nmsimplex2rand = fgsl_multimin_fminimizer_type(3)
- type(fgsl_multimin_fdfminimizer_type), parameter, public fgsl_multimin_fdfminimizer_steepest_descent = fgsl_multimin_fdfminimizer_type(1)
- type(fgsl_multimin_fdfminimizer_type), parameter, public fgsl_multimin_fdfminimizer_conjugate_pr = fgsl_multimin_fdfminimizer_type(2)
- type(fgsl_multimin_fdfminimizer_type), parameter, public fgsl_multimin_fdfminimizer_conjugate_fr = fgsl_multimin_fdfminimizer_type(3)
- type(fgsl_multimin_fdfminimizer_type), parameter, public fgsl_multimin_fdfminimizer_vector_bfgs = fgsl_multimin_fdfminimizer_type(4)
- type(fgsl_multimin_fdfminimizer_type), parameter, public fgsl_multimin_fdfminimizer_vector_bfgs2 = fgsl_multimin_fdfminimizer_type(5)
- type(fgsl_multifit_nlinear_trs), parameter, public fgsl_multifit_nlinear_trs_lm = fgsl_multifit_nlinear_trs(1)
- type(fgsl_multifit_nlinear_trs), parameter, public fgsl_multifit_nlinear_trs_lmaccel = fgsl_multifit_nlinear_trs(2)
- type(fgsl_multifit_nlinear_trs), parameter, public fgsl_multifit_nlinear_trs_dogleg = fgsl_multifit_nlinear_trs(3)
- type(fgsl_multifit_nlinear_trs), parameter, public fgsl_multifit_nlinear_trs_ddogleg = fgsl_multifit_nlinear_↩ trs(4)
- type(fgsl_multifit_nlinear_trs), parameter, public fgsl_multifit_nlinear_trs_subspace2d = fgsl_multifit_nlinear↩ _trs(5)
- type(fgsl_multilarge_nlinear_trs), parameter, public fgsl_multilarge_nlinear_trs_lm = fgsl_multilarge_nlinear↩ _trs(1)
- type(fgsl_multilarge_nlinear_trs), parameter, public fgsl_multilarge_nlinear_trs_lmaccel = fgsl_multilarge_↩ nlinear_trs(2)
- type(fgsl_multilarge_nlinear_trs), parameter, public fgsl_multilarge_nlinear_trs_dogleg = fgsl_multilarge_↩ nlinear_trs(3)
- type(fgsl_multilarge_nlinear_trs), parameter, public fgsl_multilarge_nlinear_trs_ddogleg = fgsl_multilarge_↩ nlinear_trs(4)
- type(fgsl_multilarge_nlinear_trs), parameter, public fgsl_multilarge_nlinear_trs_subspace2d = fgsl_↩ multilarge_nlinear_trs(5)
- type(fgsl_multilarge_nlinear_trs), parameter, public fgsl_multilarge_nlinear_trs_cgst = fgsl_multilarge_↩ nlinear_trs(6)

- type(fgsl_multifit_nlinear_scale), parameter, public fgsl_multifit_nlinear_scale_levenberg = fgsl_multifit_↩ nlinear_scale(1)
- type(fgsl_multifit_nlinear_scale), parameter, public fgsl_multifit_nlinear_scale_marquardt = fgsl_multifit_↩ nlinear_scale(2)
- type(fgsl_multifit_nlinear_scale), parameter, public fgsl_multifit_nlinear_scale_more = fgsl_multifit_nlinear↩ _scale(3)
- type(fgsl_multilarge_nlinear_scale), parameter, public fgsl_multilarge_nlinear_scale_levenberg = fgsl_↩ multilarge_nlinear_scale(1)
- type(fgsl_multilarge_nlinear_scale), parameter, public fgsl_multilarge_nlinear_scale_marquardt = fgsl_↩ multilarge_nlinear_scale(2)
- type(fgsl_multilarge_nlinear_scale), parameter, public fgsl_multilarge_nlinear_scale_more = fgsl_↩ multilarge_nlinear_scale(3)
- type(fgsl_multifit_nlinear_solver), parameter, public fgsl_multifit_nlinear_solver_cholesky = fgsl_multifit_↩ nlinear_solver(1)
- type(fgsl_multifit_nlinear_solver), parameter, public fgsl_multifit_nlinear_solver_qr = fgsl_multifit_nlinear_↩ solver(2)
- type(fgsl_multifit_nlinear_solver), parameter, public fgsl_multifit_nlinear_solver_svd = fgsl_multifit_nlinear_↩ solver(3)
- integer(fgsl_int), parameter, public fgsl_multifit_nlinear_fwdiff = 0
- integer(fgsl_int), parameter, public fgsl_multifit_nlinear_ctrdiff = 1
- type(fgsl_multilarge_nlinear_solver), parameter, public fgsl_multilarge_nlinear_solver_cholesky = fgsl_↩ multilarge_nlinear_solver(1)
- type(fgsl_multifit_fdfsolver_type), parameter, public fgsl_multifit_fdfsolver_lmder = fgsl_multifit_fdfsolver_type(1)
- type(fgsl_multifit_fdfsolver_type), parameter, public fgsl_multifit_fdfsolver_lmsder = fgsl_multifit_fdfsolver_type(2)
- type(fgsl_multifit_fdfsolver_type), parameter, public fgsl_multifit_fdfsolver_lmniel = fgsl_multifit_fdfsolver_type(3)
- integer(fgsl_size_t), parameter, public fgsl_spmatrix_triplet = 0
- integer(fgsl_size_t), parameter, public fgsl_spmatrix_ccs = 1
- type(fgsl_splinalg_itersolve_type), parameter, public fgsl_splinalg_itersolve_gmres = fgsl_splinalg_itersolve_type(1)
- integer(fgsl_int), parameter, public fgsl_movstat_end_padzero = 0
- integer(fgsl_int), parameter, public fgsl_movstat_end_padvalue = 1
- integer(fgsl_int), parameter, public fgsl_movstat_end_truncate = 2
- integer(fgsl_int), parameter, public fgsl_filter_end_padzero = 0

  Note: gsl_movstat_accum is not matched since the publicized interface does not make explicit use of accumulators.
- integer(fgsl_int), parameter, public fgsl_filter_end_padvalue = 1
- integer(fgsl_int), parameter, public fgsl_filter_end_truncate = 2
- integer(fgsl_int), parameter, public fgsl_filter_scale_mad = 0
- integer(fgsl_int), parameter, public fgsl_filter_scale_iqr = 1
- integer(fgsl_int), parameter, public fgsl_filter_scale_sn = 2
- integer(fgsl_int), parameter, public fgsl_filter_scale_qn = 3

47.1.1 Variable Documentation

47.1.1.1 fgsl_char

```
integer, parameter, public fgsl::fgsl_char = c_char
```

47.1.1.2 fgsl_const_cgsm_acre

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_acre = 4.04685642241e7_fgsl_double
```

47.1.1.3 fgsl_const_cgsm_angstrom

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_angstrom = 1e-8_fgsl_double
```

47.1.1.4 fgsl_const_cgsm_astronomical_unit

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_astronomical_unit = 1.49597870691e13↩
_fgsl_double
```

47.1.1.5 fgsl_const_cgsm_bar

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_bar = 1e6_fgsl_double
```

47.1.1.6 fgsl_const_cgsm_barn

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_barn = 1e-24_fgsl_double
```

47.1.1.7 fgsl_const_cgsm_bohr_magneton

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_bohr_magneton = 9.27400899e-21_↩
fgsl_double
```

47.1.1.8 fgsl_const_cgsm_bohr_radius

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_bohr_radius = 5.291772083e-9_fgsl↩
_double
```

47.1.1.9 fgsl_const_cgsm_boltzmann

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_boltzmann = 1.3806504e-16_fgsl_↩
double
```

47.1.1.10 fgsl_const_cgsm_btu

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_btu = 1.05505585262e10_fgsl_double
```

47.1.1.11 fgsl_const_cgsm_calorie

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_calorie = 4.1868e7_fgsl_double
```

47.1.1.12 fgsl_const_cgsm_canadian_gallon

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_canadian_gallon = 4.54609e3_fgsl_↩
double
```

47.1.1.13 fgsl_const_cgsm_carat

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_carat = 2e-1_fgsl_double
```

47.1.1.14 fgsl_const_cgsm_cup

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_cup = 2.36588236501e2_fgsl_double
```

47.1.1.15 fgsl_const_cgsm_curie

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_curie = 3.7e10_fgsl_double
```

47.1.1.16 fgsl_const_cgsm_day

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_day = 8.64e4_fgsl_double
```

47.1.1.17 fgsl_const_cgsm_dyne

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_dyne = 1e0_fgsl_double
```

47.1.1.18 fgsl_const_cgsm_electron_charge

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_electron_charge = 1.602176487e-20↩
_fgsl_double
```

47.1.1.19 fgsl_const_cgsm_electron_magnetic_moment

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_electron_magnetic_moment = 9.↩
28476362e-21_fgsl_double
```

47.1.1.20 fgsl_const_cgsm_electron_volt

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_electron_volt = 1.602176487e-12_↩
fgsl_double
```

47.1.1.21 fgsl_const_cgsm_erg

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_erg = 1e0_fgsl_double
```

47.1.1.22 fgsl_const_cgsm_faraday

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_faraday = 9.64853429775e3_fgsl_↩
double
```

47.1.1.23 fgsl_const_cgsm_fathom

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_fathom = 1.8288e2_fgsl_double
```

47.1.1.24 fgsl_const_cgsm_fluid_ounce

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_fluid_ounce = 2.95735295626e1_↩
fgsl_double
```

47.1.1.25 fgsl_const_cgsm_foot

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_foot = 3.048e1_fgsl_double
```

47.1.1.26 fgsl_const_cgsm_footcandle

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_footcandle = 1.076e-3_fgsl_double
```

47.1.1.27 fgsl_const_cgsm_footlambert

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_footlambert = 1.07639104e-3_fgsl_↩
double
```

47.1.1.28 fgsl_const_cgsm_gauss

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_gauss = 1e0_fgsl_double
```

47.1.1.29 fgsl_const_cgsm_gram_force

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_gram_force = 9.80665e2_fgsl_double
```

47.1.1.30 fgsl_const_cgsm_grav_accel

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_grav_accel = 9.80665e2_fgsl_double
```

47.1.1.31 fgsl_const_cgsm_gravitational_constant

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_gravitational_constant = 6.673e-8↩
_fgsl_double
```

47.1.1.32 fgsl_const_cgsm_hectare

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_hectare = 1e8_fgsl_double
```

47.1.1.33 fgsl_const_cgsm_horsepower

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_horsepower = 7.457e9_fgsl_double
```

47.1.1.34 fgsl_const_cgsm_hour

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_hour = 3.6e3_fgsl_double
```

47.1.1.35 fgsl_const_cgsm_inch

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_inch = 2.54e0_fgsl_double
```

47.1.1.36 fgsl_const_cgsm_inch_of_mercury

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_inch_of_mercury = 3.38638815789e4↩
_fgsl_double
```

47.1.1.37 fgsl_const_cgsm_inch_of_water

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_inch_of_water = 2.490889e3_fgsl_↩
double
```

47.1.1.38 fgsl_const_cgsm_joule

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_joule = 1e7_fgsl_double
```

47.1.1.39 fgsl_const_cgsm_kilometers_per_hour

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_kilometers_per_hour = 2.77777777778e1↩
_fgsl_double
```

47.1.1.40 fgsl_const_cgsm_kilopound_force

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_kilopound_force = 4.44822161526e8↩
_fgsl_double
```

47.1.1.41 fgsl_const_cgsm_knot

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_knot = 5.14444444444e1_fgsl_double
```

47.1.1.42 fgsl_const_cgsm_lambert

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_lambert = 1e0_fgsl_double
```

47.1.1.43 fgsl_const_cgsm_light_year

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_light_year = 9.46053620707e17_↩
fgsl_double
```

47.1.1.44 fgsl_const_cgsm_liter

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_liter = 1e3_fgsl_double
```

47.1.1.45 fgsl_const_cgsm_lumen

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_lumen = 1e0_fgsl_double
```

47.1.1.46 fgsl_const_cgsm_lux

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_lux = 1e-4_fgsl_double
```

47.1.1.47 fgsl_const_cgsm_mass_electron

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_mass_electron = 9.10938188e-28_↩
fgsl_double
```

47.1.1.48 fgsl_const_cgsm_mass_muon

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_mass_muon = 1.88353109e-25_fgsl_↩
double
```

47.1.1.49 fgsl_const_cgsm_mass_neutron

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_mass_neutron = 1.67492716e-24_↩
fgsl_double
```

47.1.1.50 fgsl_const_cgsm_mass_proton

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_mass_proton = 1.67262158e-24_fgsl↩
_double
```

47.1.1.51 fgsl_const_cgsm_meter_of_mercury

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_meter_of_mercury = 1.33322368421e6↩
_fgsl_double
```

47.1.1.52 fgsl_const_cgsm_metric_ton

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_metric_ton = 1e6_fgsl_double
```

47.1.1.53 fgsl_const_cgsm_micron

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_micron = 1e-4_fgsl_double
```

47.1.1.54 fgsl_const_cgsm_mil

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_mil = 2.54e-3_fgsl_double
```

47.1.1.55 fgsl_const_cgsm_mile

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_mile = 1.609344e5_fgsl_double
```

47.1.1.56 fgsl_const_cgsm_miles_per_hour

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_miles_per_hour = 4.4704e1_fgsl_↩
double
```

47.1.1.57 fgsl_const_cgsm_minute

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_minute = 6e1_fgsl_double
```

47.1.1.58 fgsl_const_cgsm_molar_gas

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_molar_gas = 8.314472e7_fgsl_double
```

47.1.1.59 fgsl_const_cgsm_nautical_mile

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_nautical_mile = 1.852e5_fgsl_double
```

47.1.1.60 fgsl_const_cgsm_newton

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_newton = 1e5_fgsl_double
```

47.1.1.61 fgsl_const_cgsm_nuclear_magneton

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_nuclear_magneton = 5.05078317e-24↩
_fgsl_double
```

47.1.1.62 fgsl_const_cgsm_ounce_mass

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_ounce_mass = 2.8349523125e1_fgsl_↩
double
```

47.1.1.63 fgsl_const_cgsm_parsec

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_parsec = 3.08567758135e18_fgsl_↩
double
```

47.1.1.64 fgsl_const_cgsm_phot

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_phot = 1e0_fgsl_double
```

47.1.1.65 fgsl_const_cgsm_pint

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_pint = 4.73176473002e2_fgsl_double
```

47.1.1.66 fgsl_const_cgsm_plancks_constant_h

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_plancks_constant_h = 6.62606896e-27↩
_fgsl_double
```

47.1.1.67 fgsl_const_cgsm_plancks_constant_hbar

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_plancks_constant_hbar = 1.05457162825e-27↩
_fgsl_double
```

47.1.1.68 fgsl_const_cgsm_point

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_point = 3.52777777778e-2_fgsl_↩
double
```

47.1.1.69 fgsl_const_cgsm_poise

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_poise = 1e0_fgsl_double
```

47.1.1.70 fgsl_const_cgsm_pound_force

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_pound_force = 4.44822161526e5_↩
fgsl_double
```

47.1.1.71 fgsl_const_cgsm_pound_mass

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_pound_mass = 4.5359237e2_fgsl_↩
double
```

47.1.1.72 fgsl_const_cgsm_poundal

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_poundal = 1.38255e4_fgsl_double
```

47.1.1.73 fgsl_const_cgsm_proton_magnetic_moment

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_proton_magnetic_moment = 1.410606633e-23↩
_fgsl_double
```

47.1.1.74 fgsl_const_cgsm_psi

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_psi = 6.89475729317e4_fgsl_double
```

47.1.1.75 fgsl_const_cgsm_quart

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_quart = 9.46352946004e2_fgsl_double
```

47.1.1.76 fgsl_const_cgsm_rad

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_rad = 1e2_fgsl_double
```

47.1.1.77 fgsl_const_cgsm_roentgen

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_roentgen = 2.58e-8_fgsl_double
```

47.1.1.78 fgsl_const_cgsm_rydberg

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_rydberg = 2.17987196968e-11_fgsl_↩
double
```

47.1.1.79 fgsl_const_cgsm_solar_mass

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_solar_mass = 1.98892e33_fgsl_double
```

47.1.1.80 fgsl_const_cgsm_speed_of_light

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_speed_of_light = 2.99792458e10_↩
fgsl_double
```

47.1.1.81 fgsl_const_cgsm_standard_gas_volume

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_standard_gas_volume = 2.2710981e4↩
_fgsl_double
```

47.1.1.82 fgsl_const_cgsm_std_atmosphere

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_std_atmosphere = 1.01325e6_fgsl_↩
double
```

47.1.1.83 fgsl_const_cgsm_stefan_boltzmann_constant

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_stefan_boltzmann_constant = 5.↩
67040047374e-5_fgsl_double
```

47.1.1.84 fgsl_const_cgsm_stilb

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_stilb = 1e0_fgsl_double
```

47.1.1.85 fgsl_const_cgsm_stokes

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_stokes = 1e0_fgsl_double
```

47.1.1.86 fgsl_const_cgsm_tablespoon

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_tablespoon = 1.47867647813e1_fgsl↩
_double
```

47.1.1.87 fgsl_const_cgsm_teaspoon

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_teaspoon = 4.92892159375e0_fgsl_↩
double
```

47.1.1.88 fgsl_const_cgsm_texpoint

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_texpoint = 3.51459803515e-2_fgsl_↩
double
```

47.1.1.89 fgsl_const_cgsm_therm

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_therm = 1.05506e15_fgsl_double
```

47.1.1.90 fgsl_const_cgsm_thomson_cross_section

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_thomson_cross_section = 6.65245893699e-25↩
_fgsl_double
```

47.1.1.91 fgsl_const_cgsm_ton

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_ton = 9.0718474e5_fgsl_double
```

47.1.1.92 fgsl_const_cgsm_torr

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_torr = 1.33322368421e3_fgsl_double
```

47.1.1.93 fgsl_const_cgsm_troy_ounce

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_troy_ounce = 3.1103475e1_fgsl_↩
double
```

47.1.1.94 fgsl_const_cgsm_uk_gallon

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_uk_gallon = 4.546092e3_fgsl_double
```

47.1.1.95 fgsl_const_cgsm_uk_ton

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_uk_ton = 1.0160469088e6_fgsl_double
```

47.1.1.96 fgsl_const_cgsm_unified_atomic_mass

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_unified_atomic_mass = 1.660538782e-24↩
_fgsl_double
```

47.1.1.97 fgsl_const_cgsm_us_gallon

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_us_gallon = 3.78541178402e3_fgsl_↩
double
```

47.1.1.98 fgsl_const_cgsm_week

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_week = 6.048e5_fgsl_double
```

47.1.1.99 fgsl_const_cgsm_yard

```
real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_yard = 9.144e1_fgsl_double
```

47.1.1.100 fgsl_const_mksa_acre

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_acre = 4.04685642241e3_fgsl_double
```

47.1.1.101 fgsl_const_mksa_angstrom

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_angstrom = 1e-10_fgsl_double
```

47.1.1.102 fgsl_const_mksa_astronomical_unit

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_astronomical_unit = 1.49597870691e11↩
_fgsl_double
```

47.1.1.103 fgsl_const_mksa_bar

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_bar = 1e5_fgsl_double
```

47.1.1.104 fgsl_const_mksa_barn

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_barn = 1e-28_fgsl_double
```

47.1.1.105 fgsl_const_mksa_bohr_magneton

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_bohr_magneton = 9.27400899e-24_↩
fgsl_double
```

47.1.1.106 fgsl_const_mksa_bohr_radius

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_bohr_radius = 5.291772083e-11_↩
fgsl_double
```

47.1.1.107 fgsl_const_mksa_boltzmann

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_boltzmann = 1.3806504e-23_fgsl_↩
double
```

47.1.1.108 fgsl_const_mksa_btu

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_btu = 1.05505585262e3_fgsl_double
```

47.1.1.109 fgsl_const_mksa_calorie

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_calorie = 4.1868e0_fgsl_double
```

47.1.1.110 fgsl_const_mksa_canadian_gallon

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_canadian_gallon = 4.54609e-3_fgsl↩
_double
```

47.1.1.111 fgsl_const_mksa_carat

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_carat = 2e-4_fgsl_double
```

47.1.1.112 fgsl_const_mksa_cup

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_cup = 2.36588236501e-4_fgsl_double
```

47.1.1.113 fgsl_const_mksa_curie

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_curie = 3.7e10_fgsl_double
```

47.1.1.114 fgsl_const_mksa_day

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_day = 8.64e4_fgsl_double
```

47.1.1.115 fgsl_const_mksa_debye

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_debye = 3.33564095198e-30_fgsl_↩
double
```

47.1.1.116 fgsl_const_mksa_dyne

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_dyne = 1e-5_fgsl_double
```

47.1.1.117 fgsl_const_mksa_electron_charge

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_electron_charge = 1.602176487e-19↩
_fgsl_double
```

47.1.1.118 fgsl_const_mksa_electron_magnetic_moment

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_electron_magnetic_moment = 9.↩
28476362e-24_fgsl_double
```

47.1.1.119 fgsl_const_mksa_electron_volt

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_electron_volt = 1.602176487e-19_↩
fgsl_double
```

47.1.1.120 fgsl_const_mksa_erg

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_erg = 1e-7_fgsl_double
```

47.1.1.121 fgsl_const_mksa_faraday

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_faraday = 9.64853429775e4_fgsl_↩
double
```

47.1.1.122 fgsl_const_mksa_fathom

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_fathom = 1.8288e0_fgsl_double
```

47.1.1.123 fgsl_const_mksa_fluid_ounce

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_fluid_ounce = 2.95735295626e-5_↩
fgsl_double
```

47.1.1.124 fgsl_const_mksa_foot

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_foot = 3.048e-1_fgsl_double
```

47.1.1.125 fgsl_const_mksa_footcandle

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_footcandle = 1.076e1_fgsl_double
```

47.1.1.126 fgsl_const_mksa_footlambert

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_footlambert = 1.07639104e1_fgsl_↩
double
```

47.1.1.127 fgsl_const_mksa_gauss

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_gauss = 1e-4_fgsl_double
```

47.1.1.128 fgsl_const_mksa_gram_force

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_gram_force = 9.80665e-3_fgsl_double
```

47.1.1.129 fgsl_const_mksa_grav_accel

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_grav_accel = 9.80665e0_fgsl_double
```

47.1.1.130 fgsl_const_mksa_gravitational_constant

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_gravitational_constant = 6.673e-11↩
_fgsl_double
```

47.1.1.131 fgsl_const_mksa_hectare

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_hectare = 1e4_fgsl_double
```

47.1.1.132 fgsl_const_mksa_horsepower

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_horsepower = 7.457e2_fgsl_double
```

47.1.1.133 fgsl_const_mksa_hour

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_hour = 3.6e3_fgsl_double
```

47.1.1.134 fgsl_const_mksa_inch

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_inch = 2.54e-2_fgsl_double
```

47.1.1.135 fgsl_const_mksa_inch_of_mercury

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_inch_of_mercury = 3.38638815789e3↩
_fgsl_double
```

47.1.1.136 fgsl_const_mksa_inch_of_water

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_inch_of_water = 2.490889e2_fgsl_↩
double
```

47.1.1.137 fgsl_const_mksa_joule

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_joule = 1e0_fgsl_double
```

47.1.1.138 fgsl_const_mksa_kilometers_per_hour

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_kilometers_per_hour = 2.77777777778e-1↩
_fgsl_double
```

47.1.1.139 fgsl_const_mksa_kilopound_force

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_kilopound_force = 4.44822161526e3↩
_fgsl_double
```

47.1.1.140 fgsl_const_mksa_knot

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_knot = 5.14444444444e-1_fgsl_double
```

47.1.1.141 fgsl_const_mksa_lambert

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_lambert = 1e4_fgsl_double
```

47.1.1.142 fgsl_const_mksa_light_year

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_light_year = 9.46053620707e15_↩
fgsl_double
```

47.1.1.143 fgsl_const_mksa_liter

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_liter = 1e-3_fgsl_double
```

47.1.1.144 fgsl_const_mksa_lumen

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_lumen = 1e0_fgsl_double
```

47.1.1.145 fgsl_const_mksa_lux

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_lux = 1e0_fgsl_double
```

47.1.1.146 fgsl_const_mksa_mass_electron

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_mass_electron = 9.10938188e-31_↩
fgsl_double
```

47.1.1.147 fgsl_const_mksa_mass_muon

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_mass_muon = 1.88353109e-28_fgsl_↩
double
```

47.1.1.148 fgsl_const_mksa_mass_neutron

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_mass_neutron = 1.67492716e-27_↩
fgsl_double
```

47.1.1.149 fgsl_const_mksa_mass_proton

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_mass_proton = 1.67262158e-27_fgsl↩
_double
```

47.1.1.150 fgsl_const_mksa_meter_of_mercury

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_meter_of_mercury = 1.33322368421e5↩
_fgsl_double
```

47.1.1.151 fgsl_const_mksa_metric_ton

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_metric_ton = 1e3_fgsl_double
```

47.1.1.152 fgsl_const_mksa_micron

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_micron = 1e-6_fgsl_double
```

47.1.1.153 fgsl_const_mksa_mil

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_mil = 2.54e-5_fgsl_double
```

47.1.1.154 fgsl_const_mksa_mile

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_mile = 1.609344e3_fgsl_double
```

47.1.1.155 fgsl_const_mksa_miles_per_hour

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_miles_per_hour = 4.4704e-1_fgsl_↩
double
```

47.1.1.156 fgsl_const_mksa_minute

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_minute = 6e1_fgsl_double
```

47.1.1.157 fgsl_const_mksa_molar_gas

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_molar_gas = 8.314472e0_fgsl_double
```

47.1.1.158 fgsl_const_mksa_nautical_mile

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_nautical_mile = 1.852e3_fgsl_double
```

47.1.1.159 fgsl_const_mksa_newton

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_newton = 1e0_fgsl_double
```

47.1.1.160 fgsl_const_mksa_nuclear_magneton

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_nuclear_magneton = 5.05078317e-27↩
_fgsl_double
```

47.1.1.161 fgsl_const_mksa_ounce_mass

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_ounce_mass = 2.8349523125e-2_fgsl↩
_double
```

47.1.1.162 fgsl_const_mksa_parsec

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_parsec = 3.08567758135e16_fgsl_↩
double
```

47.1.1.163 fgsl_const_mksa_phot

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_phot = 1e4_fgsl_double
```

47.1.1.164 fgsl_const_mksa_pint

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_pint = 4.73176473002e-4_fgsl_double
```

47.1.1.165 fgsl_const_mksa_plancks_constant_h

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_plancks_constant_h = 6.62606896e-34↩
_fgsl_double
```

47.1.1.166 fgsl_const_mksa_plancks_constant_hbar

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_plancks_constant_hbar = 1.05457162825e-34↩
_fgsl_double
```

47.1.1.167 fgsl_const_mksa_point

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_point = 3.52777777778e-4_fgsl_↩
double
```

47.1.1.168 fgsl_const_mksa_poise

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_poise = 1e-1_fgsl_double
```

47.1.1.169 fgsl_const_mksa_pound_force

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_pound_force = 4.44822161526e0_↩
fgsl_double
```

47.1.1.170 fgsl_const_mksa_pound_mass

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_pound_mass = 4.5359237e-1_fgsl_↩
double
```

47.1.1.171 fgsl_const_mksa_poundal

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_poundal = 1.38255e-1_fgsl_double
```

47.1.1.172 fgsl_const_mksa_proton_magnetic_moment

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_proton_magnetic_moment = 1.410606633e-26↩
_fgsl_double
```

47.1.1.173 fgsl_const_mksa_psi

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_psi = 6.89475729317e3_fgsl_double
```

47.1.1.174 fgsl_const_mksa_quart

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_quart = 9.46352946004e-4_fgsl_↩
double
```

47.1.1.175 fgsl_const_mksa_rad

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_rad = 1e-2_fgsl_double
```

47.1.1.176 fgsl_const_mksa_roentgen

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_roentgen = 2.58e-4_fgsl_double
```

47.1.1.177 fgsl_const_mksa_rydberg

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_rydberg = 2.17987196968e-18_fgsl_↩
double
```

47.1.1.178 fgsl_const_mksa_solar_mass

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_solar_mass = 1.98892e30_fgsl_double
```

47.1.1.179 fgsl_const_mksa_speed_of_light

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_speed_of_light = 2.99792458e8_↩
fgsl_double
```

47.1.1.180 fgsl_const_mksa_standard_gas_volume

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_standard_gas_volume = 2.2710981e-2↩
_fgsl_double
```

47.1.1.181 fgsl_const_mksa_std_atmosphere

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_std_atmosphere = 1.01325e5_fgsl_↩
double
```

47.1.1.182 fgsl_const_mksa_stefan_boltzmann_constant

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_stefan_boltzmann_constant = 5.↩
67040047374e-8_fgsl_double
```

47.1.1.183 fgsl_const_mksa_stilb

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_stilb = 1e4_fgsl_double
```

47.1.1.184 fgsl_const_mksa_stokes

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_stokes = 1e-4_fgsl_double
```

47.1.1.185 fgsl_const_mksa_tablespoon

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_tablespoon = 1.47867647813e-5_↩
fgsl_double
```

47.1.1.186 fgsl_const_mksa_teaspoon

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_teaspoon = 4.92892159375e-6_fgsl_↩
double
```

47.1.1.187 fgsl_const_mksa_texpoint

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_texpoint = 3.51459803515e-4_fgsl_↩
double
```

47.1.1.188 fgsl_const_mksa_therm

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_therm = 1.05506e8_fgsl_double
```

47.1.1.189 fgsl_const_mksa_thomson_cross_section

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_thomson_cross_section = 6.65245893699e-29↩
_fgsl_double
```

47.1.1.190 fgsl_const_mksa_ton

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_ton = 9.0718474e2_fgsl_double
```

47.1.1.191 fgsl_const_mksa_torr

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_torr = 1.33322368421e2_fgsl_double
```

47.1.1.192 fgsl_const_mksa_troy_ounce

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_troy_ounce = 3.1103475e-2_fgsl_↩
double
```

47.1.1.193 fgsl_const_mksa_uk_gallon

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_uk_gallon = 4.546092e-3_fgsl_double
```

47.1.1.194 fgsl_const_mksa_uk_ton

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_uk_ton = 1.0160469088e3_fgsl_double
```

47.1.1.195 fgsl_const_mksa_unified_atomic_mass

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_unified_atomic_mass = 1.660538782e-27↩
_fgsl_double
```

47.1.1.196 fgsl_const_mksa_us_gallon

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_us_gallon = 3.78541178402e-3_fgsl↩
_double
```

47.1.1.197 fgsl_const_mksa_vacuum_permeability

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_vacuum_permeability = 1.25663706144e-6↩
_fgsl_double
```

47.1.1.198 fgsl_const_mksa_vacuum_permittivity

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_vacuum_permittivity = 8.854187817e-12↩
_fgsl_double
```

47.1.1.199 fgsl_const_mksa_week

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_week = 6.048e5_fgsl_double
```

47.1.1.200 fgsl_const_mksa_yard

```
real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_yard = 9.144e-1_fgsl_double
```

47.1.1.201 fgsl_const_num_atto

```
real(fgsl_double), parameter, public fgsl::fgsl_const_num_atto = 1e-18_fgsl_double
```

47.1.1.202 fgsl_const_num_avogadro

```
real(fgsl_double), parameter, public fgsl::fgsl_const_num_avogadro = 6.02214199E23_fgsl_double
```

47.1.1.203 fgsl_const_num_exa

```
real(fgsl_double), parameter, public fgsl::fgsl_const_num_exa = 1e18_fgsl_double
```

47.1.1.204 fgsl_const_num_femto

```
real(fgsl_double), parameter, public fgsl::fgsl_const_num_femto = 1e-15_fgsl_double
```

47.1.1.205 fgsl_const_num_fine_structure

```
real(fgsl_double), parameter, public fgsl::fgsl_const_num_fine_structure = 7.297352533E-3_↩
fgsl_double
```

47.1.1.206 fgsl_const_num_giga

```
real(fgsl_double), parameter, public fgsl::fgsl_const_num_giga = 1e9_fgsl_double
```

47.1.1.207 fgsl_const_num_kilo

```
real(fgsl_double), parameter, public fgsl::fgsl_const_num_kilo = 1e3_fgsl_double
```

47.1.1.208 fgsl_const_num_mega

```
real(fgsl_double), parameter, public fgsl::fgsl_const_num_mega = 1e6_fgsl_double
```

47.1.1.209 fgsl_const_num_micro

```
real(fgsl_double), parameter, public fgsl::fgsl_const_num_micro = 1e-6_fgsl_double
```

47.1.1.210 fgsl_const_num_milli

```
real(fgsl_double), parameter, public fgsl::fgsl_const_num_milli = 1e-3_fgsl_double
```

47.1.1.211 fgsl_const_num_nano

```
real(fgsl_double), parameter, public fgsl::fgsl_const_num_nano = 1e-9_fgsl_double
```

47.1.1.212 fgsl_const_num_peta

```
real(fgsl_double), parameter, public fgsl::fgsl_const_num_peta = 1e15_fgsl_double
```

47.1.1.213 fgsl_const_num_pico

```
real(fgsl_double), parameter, public fgsl::fgsl_const_num_pico = 1e-12_fgsl_double
```

47.1.1.214 fgsl_const_num_tera

```
real(fgsl_double), parameter, public fgsl::fgsl_const_num_tera = 1e12_fgsl_double
```

47.1.1.215 fgsl_const_num_yocto

```
real(fgsl_double), parameter, public fgsl::fgsl_const_num_yocto = 1e-24_fgsl_double
```

47.1.1.216 fgsl_const_num_yotta

```
real(fgsl_double), parameter, public fgsl::fgsl_const_num_yotta = 1e24_fgsl_double
```

47.1.1.217 fgsl_const_num_zepto

```
real(fgsl_double), parameter, public fgsl::fgsl_const_num_zepto = 1e-21_fgsl_double
```

47.1.1.218 fgsl_const_num_zetta

```
real(fgsl_double), parameter, public fgsl::fgsl_const_num_zetta = 1e21_fgsl_double
```

47.1.1.219 fgsl_continue

```
integer(fgsl_int), parameter, public fgsl::fgsl_continue = -2
```

47.1.1.220 fgsl_double

```
integer, parameter, public fgsl::fgsl_double = c_double
```

47.1.1.221 fgsl_double_complex

```
integer, parameter, public fgsl::fgsl_double_complex = c_double_complex
```

47.1.1.222 fgsl_ebadfunc

```
integer(fgsl_int), parameter, public fgsl::fgsl_ebadfunc = 9
```

47.1.1.223 fgsl_ebadlen

```
integer(fgsl_int), parameter, public fgsl::fgsl_ebadlen = 19
```

47.1.1.224 fgsl_ebadtol

```
integer(fgsl_int), parameter, public fgsl::fgsl_ebadtol = 13
```

47.1.1.225 fgsl_ecache

```
integer(fgsl_int), parameter, public fgsl::fgsl_ecache = 25
```

47.1.1.226 fgsl_ediverge

```
integer(fgsl_int), parameter, public fgsl::fgsl_ediverge = 22
```

47.1.1.227 fgsl_edom

```
integer(fgsl_int), parameter, public fgsl::fgsl_edom = 1
```

47.1.1.228 fgsl_efactor

```
integer(fgsl_int), parameter, public fgsl::fgsl_efactor = 6
```

47.1.1.229 fgsl_efault

```
integer(fgsl_int), parameter, public fgsl::fgsl_efault = 3
```

47.1.1.230 fgsl_eigen_sort_abs_asc

```
integer(c_int), parameter, public fgsl::fgsl_eigen_sort_abs_asc = 2
```

47.1.1.231 fgsl_eigen_sort_abs_desc

```
integer(c_int), parameter, public fgsl::fgsl_eigen_sort_abs_desc = 3
```

47.1.1.232 fgsl_eigen_sort_val_asc

```
integer(c_int), parameter, public fgsl::fgsl_eigen_sort_val_asc = 0
```

47.1.1.233 fgsl_eigen_sort_val_desc

```
integer(c_int), parameter, public fgsl::fgsl_eigen_sort_val_desc = 1
```

47.1.1.234 fgsl_einval

```
integer(fgsl_int), parameter, public fgsl::fgsl_einval = 4
```

47.1.1.235 fgsl_eloss

```
integer(fgsl_int), parameter, public fgsl::fgsl_eloss = 17
```

47.1.1.236 fgsl_emaxiter

```
integer(fgsl_int), parameter, public fgsl::fgsl_emaxiter = 11
```

47.1.1.237 fgsl_enomem

```
integer(fgsl_int), parameter, public fgsl::fgsl_enomem = 8
```

47.1.1.238 fgsl_enoprog

```
integer(fgsl_int), parameter, public fgsl::fgsl_enoprog = 27
```

47.1.1.239 fgsl_enoprogj

```
integer(fgsl_int), parameter, public fgsl::fgsl_enoprogj = 28
```

47.1.1.240 fgsl_enotsqr

```
integer(fgsl_int), parameter, public fgsl::fgsl_enotsqr = 20
```

47.1.1.241 fgsl_eof

```
integer(fgsl_int), parameter, public fgsl::fgsl_eof = 32
```

47.1.1.242 fgsl_eovrflw

```
integer(fgsl_int), parameter, public fgsl::fgsl_eovrflw = 16
```

47.1.1.243 fgsl_erange

```
integer(fgsl_int), parameter, public fgsl::fgsl_erange = 2
```

47.1.1.244 fgsl_eround

```
integer(fgsl_int), parameter, public fgsl::fgsl_eround = 18
```

47.1.1.245 fgsl_erunaway

```
integer(fgsl_int), parameter, public fgsl::fgsl_erunaway = 10
```

47.1.1.246 fgsl_esanity

```
integer(fgsl_int), parameter, public fgsl::fgsl_esanity = 7
```

47.1.1.247 fgsl_esing

```
integer(fgsl_int), parameter, public fgsl::fgsl_esing = 21
```

47.1.1.248 fgsl_etable

```
integer(fgsl_int), parameter, public fgsl::fgsl_etable = 26
```

47.1.1.249 fgsl_etol

```
integer(fgsl_int), parameter, public fgsl::fgsl_etol = 14
```

47.1.1.250 fgsl_etolf

```
integer(fgsl_int), parameter, public fgsl::fgsl_etolf = 29
```

47.1.1.251 fgsl_etolg

```
integer(fgsl_int), parameter, public fgsl::fgsl_etolg = 31
```

47.1.1.252 fgsl_etolx

```
integer(fgsl_int), parameter, public fgsl::fgsl_etolx = 30
```

47.1.1.253 fgsl_eundrflw

```
integer(fgsl_int), parameter, public fgsl::fgsl_eundrflw = 15
```

47.1.1.254 fgsl_eunimpl

```
integer(fgsl_int), parameter, public fgsl::fgsl_eunimpl = 24
```

47.1.1.255 fgsl_eunsup

```
integer(fgsl_int), parameter, public fgsl::fgsl_eunsup = 23
```

47.1.1.256 fgsl_extended

```
integer, parameter, public fgsl::fgsl_extended = selected_real_kind(13)
```

47.1.1.257 fgsl_ezerodiv

```
integer(fgsl_int), parameter, public fgsl::fgsl_ezerodiv = 12
```

47.1.1.258 fgsl_failure

```
integer(fgsl_int), parameter, public fgsl::fgsl_failure = -1
```

47.1.1.259 fgsl_filter_end_padvalue

```
integer(fgsl_int), parameter, public fgsl::fgsl_filter_end_padvalue = 1
```

47.1.1.260 fgsl_filter_end_padzero

```
integer(fgsl_int), parameter, public fgsl::fgsl_filter_end_padzero = 0
```

Note: gsl_movstat_accum is not matched since the publicized interface does not make explicit use of accumulators.

47.1.1.261 fgsl_filter_end_truncate

```
integer(fgsl_int), parameter, public fgsl::fgsl_filter_end_truncate = 2
```

47.1.1.262 fgsl_filter_scale_iqr

```
integer(fgsl_int), parameter, public fgsl::fgsl_filter_scale_iqr = 1
```

47.1.1.263 fgsl_filter_scale_mad

```
integer(fgsl_int), parameter, public fgsl::fgsl_filter_scale_mad = 0
```

47.1.1.264 fgsl_filter_scale_qn

```
integer(fgsl_int), parameter, public fgsl::fgsl_filter_scale_qn = 3
```

47.1.1.265 fgsl_filter_scale_sn

```
integer(fgsl_int), parameter, public fgsl::fgsl_filter_scale_sn = 2
```

47.1.1.266 fgsl_float

```
integer, parameter, public fgsl::fgsl_float = c_float
```

47.1.1.267 fgsl_gslbase

```
character(kind=fgsl_char, len=*), parameter, public fgsl::fgsl_gslbase =GSL_VERSION
```

47.1.1.268 fgsl_int

```
integer, parameter, public fgsl::fgsl_int = c_int
```

47.1.1.269 fgsl_integ_cosine

```
integer(fgsl_int), parameter, public fgsl::fgsl_integ_cosine = 0
```

47.1.1.270 fgsl_integ_gauss15

```
integer(fgsl_int), parameter, public fgsl::fgsl_integ_gauss15 = 1
```

47.1.1.271 fgsl_integ_gauss21

```
integer(fgsl_int), parameter, public fgsl::fgsl_integ_gauss21 = 2
```

47.1.1.272 fgsl_integ_gauss31

```
integer(fgsl_int), parameter, public fgsl::fgsl_integ_gauss31 = 3
```

47.1.1.273 fgsl_integ_gauss41

```
integer(fgsl_int), parameter, public fgsl::fgsl_integ_gauss41 = 4
```

47.1.1.274 fgsl_integ_gauss51

```
integer(fgsl_int), parameter, public fgsl::fgsl_integ_gauss51 = 5
```

47.1.1.275 fgsl_integ_gauss61

```
integer(fgsl_int), parameter, public fgsl::fgsl_integ_gauss61 = 6
```

47.1.1.276 fgsl_integ_sine

```
integer(fgsl_int), parameter, public fgsl::fgsl_integ_sine = 1
```

47.1.1.277 fgsl_integration_fixed_chebyshev

```
integer(fgsl_int), parameter, public fgsl::fgsl_integration_fixed_chebyshev = 2
```

47.1.1.278 fgsl_integration_fixed_chebyshev2

```
integer(fgsl_int), parameter, public fgsl::fgsl_integration_fixed_chebyshev2 = 9
```

47.1.1.279 fgsl_integration_fixed_exponential

```
integer(fgsl_int), parameter, public fgsl::fgsl_integration_fixed_exponential = 7
```

47.1.1.280 fgsl_integration_fixed_gegenbauer

```
integer(fgsl_int), parameter, public fgsl::fgsl_integration_fixed_gegenbauer = 3
```

47.1.1.281 fgsl_integration_fixed_hermite

```
integer(fgsl_int), parameter, public fgsl::fgsl_integration_fixed_hermite = 6
```

47.1.1.282 fgsl_integration_fixed_jacobi

```
integer(fgsl_int), parameter, public fgsl::fgsl_integration_fixed_jacobi = 4
```

47.1.1.283 fgsl_integration_fixed_laguerre

```
integer(fgsl_int), parameter, public fgsl::fgsl_integration_fixed_laguerre = 5
```

47.1.1.284 fgsl_integration_fixed_legendre

```
integer(fgsl_int), parameter, public fgsl::fgsl_integration_fixed_legendre = 1
```

47.1.1.285 fgsl_integration_fixed_rational

```
integer(fgsl_int), parameter, public fgsl::fgsl_integration_fixed_rational = 8
```

47.1.1.286 fgsl_interp2d_bicubic

```
type(fgsl_interp2d_type), parameter, public fgsl::fgsl_interp2d_bicubic = fgsl_interp2d_type(2)
```

47.1.1.287 fgsl_interp2d_bilinear

```
type(fgsl_interp2d_type), parameter, public fgsl::fgsl_interp2d_bilinear = fgsl_interp2d_type(1)
```

47.1.1.288 fgsl_interp_akima

```
type(fgsl_interp_type), parameter, public fgsl::fgsl_interp_akima = fgsl_interp_type(5)
```

47.1.1.289 fgsl_interp_akima_periodic

```
type(fgsl_interp_type), parameter, public fgsl::fgsl_interp_akima_periodic = fgsl_interp_type(6)
```

47.1.1.290 fgsl_interp_cspline

```
type(fgsl_interp_type), parameter, public fgsl::fgsl_interp_cspline = fgsl_interp_type(3)
```

47.1.1.291 fgsl_interp_cspline_periodic

```
type(fgsl_interp_type), parameter, public fgsl::fgsl_interp_cspline_periodic = fgsl_interp_type(4)
```

47.1.1.292 fgsl_interp_linear

```
type(fgsl_interp_type), parameter, public fgsl::fgsl_interp_linear = fgsl_interp_type(1)
```

47.1.1.293 fgsl_interp_polynomial

```
type(fgsl_interp_type), parameter, public fgsl::fgsl_interp_polynomial = fgsl_interp_type(2)
```

47.1.1.294 fgsl_interp_steffen

```
type(fgsl_interp_type), parameter, public fgsl::fgsl_interp_steffen = fgsl_interp_type(7)
```

47.1.1.295 fgsl_long

```
integer, parameter, public fgsl::fgsl_long = c_long
```

47.1.1.296 fgsl_min_fminimizer_brent

```
type(fgsl_min_fminimizer_type), parameter, public fgsl::fgsl_min_fminimizer_brent = fgsl_min_fminimizer_type(2
```

47.1.1.297 fgsl_min_fminimizer_goldensection

```
type(fgsl_min_fminimizer_type), parameter, public fgsl::fgsl_min_fminimizer_goldensection =
fgsl_min_fminimizer_type(1)
```

47.1.1.298 fgsl_min_fminimizer_quad_golden

```
type(fgsl_min_fminimizer_type), parameter, public fgsl::fgsl_min_fminimizer_quad_golden =
fgsl_min_fminimizer_type(3)
```

47.1.1.299 fgsl_movstat_end_padvalue

```
integer(fgsl_int), parameter, public fgsl::fgsl_movstat_end_padvalue = 1
```

47.1.1.300 fgsl_movstat_end_padzero

```
integer(fgsl_int), parameter, public fgsl::fgsl_movstat_end_padzero = 0
```

47.1.1.301 fgsl_movstat_end_truncate

```
integer(fgsl_int), parameter, public fgsl::fgsl_movstat_end_truncate = 2
```

47.1.1.302 fgsl_multifit_fdfsolver_lmder

```
type(fgsl_multifit_fdfsolver_type), parameter, public fgsl::fgsl_multifit_fdfsolver_lmder =
fgsl_multifit_fdfsolver_type(1)
```

47.1.1.303 fgsl_multifit_fdfsolver_lmniel

```
type(fgsl_multifit_fdfsolver_type), parameter, public fgsl::fgsl_multifit_fdfsolver_lmniel =
fgsl_multifit_fdfsolver_type(3)
```

47.1.1.304 fgsl_multifit_fdfsolver_lmsder

```
type(fgsl_multifit_fdfsolver_type), parameter, public fgsl::fgsl_multifit_fdfsolver_lmsder =
fgsl_multifit_fdfsolver_type(2)
```

47.1.1.305 fgsl_multifit_nlinear_ctrdiff

```
integer(fgsl_int), parameter, public fgsl::fgsl_multifit_nlinear_ctrdiff = 1
```

47.1.1.306 fgsl_multifit_nlinear_fwdiff

```
integer(fgsl_int), parameter, public fgsl::fgsl_multifit_nlinear_fwdiff = 0
```

47.1.1.307 fgsl_multifit_nlinear_scale_levenberg

```
type(fgsl_multifit_nlinear_scale), parameter, public fgsl::fgsl_multifit_nlinear_scale_↩
levenberg = fgsl_multifit_nlinear_scale(1)
```

47.1.1.308 fgsl_multifit_nlinear_scale_marquardt

```
type(fgsl_multifit_nlinear_scale), parameter, public fgsl::fgsl_multifit_nlinear_scale_↩
marquardt = fgsl_multifit_nlinear_scale(2)
```

47.1.1.309 fgsl_multifit_nlinear_scale_more

```
type(fgsl_multifit_nlinear_scale), parameter, public fgsl::fgsl_multifit_nlinear_scale_more =
fgsl_multifit_nlinear_scale(3)
```

47.1.1.310 fgsl_multifit_nlinear_solver_cholesky

```
type(fgsl_multifit_nlinear_solver), parameter, public fgsl::fgsl_multifit_nlinear_solver_↩
cholesky = fgsl_multifit_nlinear_solver(1)
```

47.1.1.311 fgsl_multifit_nlinear_solver_qr

```
type(fgsl_multifit_nlinear_solver), parameter, public fgsl::fgsl_multifit_nlinear_solver_qr =
fgsl_multifit_nlinear_solver(2)
```

47.1.1.312 fgsl_multifit_nlinear_solver_svd

```
type(fgsl_multifit_nlinear_solver), parameter, public fgsl::fgsl_multifit_nlinear_solver_svd =
fgsl_multifit_nlinear_solver(3)
```

47.1.1.313 fgsl_multifit_nlinear_trs_ddogleg

```
type(fgsl_multifit_nlinear_trs), parameter, public fgsl::fgsl_multifit_nlinear_trs_ddogleg =
fgsl_multifit_nlinear_trs(4)
```

47.1.1.314 fgsl_multifit_nlinear_trs_dogleg

```
type(fgsl_multifit_nlinear_trs), parameter, public fgsl::fgsl_multifit_nlinear_trs_dogleg =
fgsl_multifit_nlinear_trs(3)
```

47.1.1.315 fgsl_multifit_nlinear_trs_lm

```
type(fgsl_multifit_nlinear_trs), parameter, public fgsl::fgsl_multifit_nlinear_trs_lm = fgsl↩
_multifit_nlinear_trs(1)
```

47.1.1.316 fgsl_multifit_nlinear_trs_lmaccel

```
type(fgsl_multifit_nlinear_trs), parameter, public fgsl::fgsl_multifit_nlinear_trs_lmaccel =
fgsl_multifit_nlinear_trs(2)
```

47.1.1.317 fgsl_multifit_nlinear_trs_subspace2d

```
type(fgsl_multifit_nlinear_trs), parameter, public fgsl::fgsl_multifit_nlinear_trs_subspace2d
= fgsl_multifit_nlinear_trs(5)
```

47.1.1.318 fgsl_multifit_robust_bisquare

```
type(fgsl_multifit_robust_type), parameter, public fgsl::fgsl_multifit_robust_bisquare = fgsl_multifit_robust_
```

47.1.1.319 fgsl_multifit_robust_cauchy

```
type(fgsl_multifit_robust_type), parameter, public fgsl::fgsl_multifit_robust_cauchy = fgsl_multifit_robust_ty
```

47.1.1.320 fgsl_multifit_robust_default

```
type(fgsl_multifit_robust_type), parameter, public fgsl::fgsl_multifit_robust_default = fgsl_multifit_robust_t
```

47.1.1.321 fgsl_multifit_robust_fair

```
type(fgsl_multifit_robust_type), parameter, public fgsl::fgsl_multifit_robust_fair = fgsl_multifit_robust_type
```

47.1.1.322 fgsl_multifit_robust_huber

```
type(fgsl_multifit_robust_type), parameter, public fgsl::fgsl_multifit_robust_huber = fgsl_multifit_robust_typ
```

47.1.1.323 fgsl_multifit_robust_ols

```
type(fgsl_multifit_robust_type), parameter, public fgsl::fgsl_multifit_robust_ols = fgsl_multifit_robust_type(
```

47.1.1.324 fgsl_multifit_robust_welsch

```
type(fgsl_multifit_robust_type), parameter, public fgsl::fgsl_multifit_robust_welsch = fgsl_multifit_robust_ty
```

47.1.1.325 fgsl_multilarge_linear_normal

```
type(fgsl_multilarge_linear_type), parameter, public fgsl::fgsl_multilarge_linear_normal =
fgsl_multilarge_linear_type(1)
```

47.1.1.326 fgsl_multilarge_linear_tsqr

```
type(fgsl_multilarge_linear_type), parameter, public fgsl::fgsl_multilarge_linear_tsqr = fgsl_multilarge_linea
```

47.1.1.327 fgsl_multilarge_nlinear_scale_levenberg

```
type(fgsl_multilarge_nlinear_scale), parameter, public fgsl::fgsl_multilarge_nlinear_scale_↩
levenberg = fgsl_multilarge_nlinear_scale(1)
```

47.1.1.328 fgsl_multilarge_nlinear_scale_marquardt

```
type(fgsl_multilarge_nlinear_scale), parameter, public fgsl::fgsl_multilarge_nlinear_scale_↩
marquardt = fgsl_multilarge_nlinear_scale(2)
```

47.1.1.329 fgsl_multilarge_nlinear_scale_more

```
type(fgsl_multilarge_nlinear_scale), parameter, public fgsl::fgsl_multilarge_nlinear_scale_↩
more = fgsl_multilarge_nlinear_scale(3)
```

47.1.1.330 fgsl_multilarge_nlinear_solver_cholesky

```
type(fgsl_multilarge_nlinear_solver), parameter, public fgsl::fgsl_multilarge_nlinear_solver↩
_cholesky = fgsl_multilarge_nlinear_solver(1)
```

47.1.1.331 fgsl_multilarge_nlinear_trs_cgst

```
type(fgsl_multilarge_nlinear_trs), parameter, public fgsl::fgsl_multilarge_nlinear_trs_cgst =
fgsl_multilarge_nlinear_trs(6)
```

47.1.1.332 fgsl_multilarge_nlinear_trs_ddogleg

```
type(fgsl_multilarge_nlinear_trs), parameter, public fgsl::fgsl_multilarge_nlinear_trs_ddogleg
= fgsl_multilarge_nlinear_trs(4)
```

47.1.1.333 fgsl_multilarge_nlinear_trs_dogleg

```
type(fgsl_multilarge_nlinear_trs), parameter, public fgsl::fgsl_multilarge_nlinear_trs_dogleg
= fgsl_multilarge_nlinear_trs(3)
```

47.1.1.334 fgsl_multilarge_nlinear_trs_lm

```
type(fgsl_multilarge_nlinear_trs), parameter, public fgsl::fgsl_multilarge_nlinear_trs_lm =
fgsl_multilarge_nlinear_trs(1)
```

47.1.1.335 fgsl_multilarge_nlinear_trs_lmaccel

```
type(fgsl_multilarge_nlinear_trs), parameter, public fgsl::fgsl_multilarge_nlinear_trs_lmaccel
= fgsl_multilarge_nlinear_trs(2)
```

47.1.1.336 fgsl_multilarge_nlinear_trs_subspace2d

```
type(fgsl_multilarge_nlinear_trs), parameter, public fgsl::fgsl_multilarge_nlinear_trs_↩
subspace2d = fgsl_multilarge_nlinear_trs(5)
```

47.1.1.337 fgsl_multimin_fdfminimizer_conjugate_fr

```
type(fgsl_multimin_fdfminimizer_type), parameter, public fgsl::fgsl_multimin_fdfminimizer_↩
conjugate_fr = fgsl_multimin_fdfminimizer_type(3)
```

47.1.1.338 fgsl_multimin_fdfminimizer_conjugate_pr

```
type(fgsl_multimin_fdfminimizer_type), parameter, public fgsl::fgsl_multimin_fdfminimizer_↩
conjugate_pr = fgsl_multimin_fdfminimizer_type(2)
```

47.1.1.339 fgsl_multimin_fdfminimizer_steepest_descent

```
type(fgsl_multimin_fdfminimizer_type), parameter, public fgsl::fgsl_multimin_fdfminimizer_↩
steepest_descent = fgsl_multimin_fdfminimizer_type(1)
```

47.1.1.340 fgsl_multimin_fdfminimizer_vector_bfgs

```
type(fgsl_multimin_fdfminimizer_type), parameter, public fgsl::fgsl_multimin_fdfminimizer_↩
vector_bfgs = fgsl_multimin_fdfminimizer_type(4)
```

47.1.1.341 fgsl_multimin_fdfminimizer_vector_bfgs2

```
type(fgsl_multimin_fdfminimizer_type), parameter, public fgsl::fgsl_multimin_fdfminimizer_↩
vector_bfgs2 = fgsl_multimin_fdfminimizer_type(5)
```

47.1.1.342 fgsl_multimin_fminimizer_nmsimplex

```
type(fgsl_multimin_fminimizer_type), parameter, public fgsl::fgsl_multimin_fminimizer_nmsimplex
= fgsl_multimin_fminimizer_type(1)
```

47.1.1.343 fgsl_multimin_fminimizer_nmsimplex2

```
type(fgsl_multimin_fminimizer_type), parameter, public fgsl::fgsl_multimin_fminimizer_nmsimplex2
= fgsl_multimin_fminimizer_type(2)
```

47.1.1.344 fgsl_multimin_fminimizer_nmsimplex2rand

```
type(fgsl_multimin_fminimizer_type), parameter, public fgsl::fgsl_multimin_fminimizer_nmsimplex2rand
= fgsl_multimin_fminimizer_type(3)
```

47.1.1.345 fgsl_multiroot_fdfsolver_gnewton

```
type(fgsl_multiroot_fdfsolver_type), parameter, public fgsl::fgsl_multiroot_fdfsolver_gnewton
= fgsl_multiroot_fdfsolver_type(2)
```

47.1.1.346 fgsl_multiroot_fdfsolver_hybridj

```
type(fgsl_multiroot_fdfsolver_type), parameter, public fgsl::fgsl_multiroot_fdfsolver_hybridj
= fgsl_multiroot_fdfsolver_type(3)
```

47.1.1.347 fgsl_multiroot_fdfsolver_hybridsj

```
type(fgsl_multiroot_fdfsolver_type), parameter, public fgsl::fgsl_multiroot_fdfsolver_hybridsj
= fgsl_multiroot_fdfsolver_type(4)
```

47.1.1.348 fgsl_multiroot_fdfsolver_newton

```
type(fgsl_multiroot_fdfsolver_type), parameter, public fgsl::fgsl_multiroot_fdfsolver_newton =
fgsl_multiroot_fdfsolver_type(1)
```

47.1.1.349 fgsl_multiroot_fsolver_broyden

```
type(fgsl_multiroot_fsolver_type), parameter, public fgsl::fgsl_multiroot_fsolver_broyden =
fgsl_multiroot_fsolver_type(2)
```

47.1.1.350 fgsl_multiroot_fsolver_dnewton

```
type(fgsl_multiroot_fsolver_type), parameter, public fgsl::fgsl_multiroot_fsolver_dnewton =
fgsl_multiroot_fsolver_type(1)
```

47.1.1.351 fgsl_multiroot_fsolver_hybrid

```
type(fgsl_multiroot_fsolver_type), parameter, public fgsl::fgsl_multiroot_fsolver_hybrid =
fgsl_multiroot_fsolver_type(3)
```

47.1.1.352 fgsl_multiroot_fsolver_hybrids

```
type(fgsl_multiroot_fsolver_type), parameter, public fgsl::fgsl_multiroot_fsolver_hybrids =
fgsl_multiroot_fsolver_type(4)
```

47.1.1.353 fgsl_odeiv2_step_bsimp

```
type(fgsl_odeiv2_step_type), parameter, public fgsl::fgsl_odeiv2_step_bsimp = fgsl_odeiv2_step_type(9)
```

47.1.1.354 fgsl_odeiv2_step_msadams

```
type(fgsl_odeiv2_step_type), parameter, public fgsl::fgsl_odeiv2_step_msadams = fgsl_odeiv2_step_type(10)
```

47.1.1.355 fgsl_odeiv2_step_msbdf

```
type(fgsl_odeiv2_step_type), parameter, public fgsl::fgsl_odeiv2_step_msbdf = fgsl_odeiv2_step_type(11)
```

47.1.1.356 fgsl_odeiv2_step_rk1imp

```
type(fgsl_odeiv2_step_type), parameter, public fgsl::fgsl_odeiv2_step_rk1imp = fgsl_odeiv2_step_type(6)
```

47.1.1.357 fgsl_odeiv2_step_rk2

```
type(fgsl_odeiv2_step_type), parameter, public fgsl::fgsl_odeiv2_step_rk2 = fgsl_odeiv2_step_type(1)
```

47.1.1.358 fgsl_odeiv2_step_rk2imp

```
type(fgsl_odeiv2_step_type), parameter, public fgsl::fgsl_odeiv2_step_rk2imp = fgsl_odeiv2_step_type(7)
```

47.1.1.359 fgsl_odeiv2_step_rk4

```
type(fgsl_odeiv2_step_type), parameter, public fgsl::fgsl_odeiv2_step_rk4 = fgsl_odeiv2_step_type(2)
```

47.1.1.360 fgsl_odeiv2_step_rk4imp

```
type(fgsl_odeiv2_step_type), parameter, public fgsl::fgsl_odeiv2_step_rk4imp = fgsl_odeiv2_step_type(8)
```

47.1.1.361 fgsl_odeiv2_step_rk8pd

```
type(fgsl_odeiv2_step_type), parameter, public fgsl::fgsl_odeiv2_step_rk8pd = fgsl_odeiv2_step_type(5)
```

47.1.1.362 fgsl_odeiv2_step_rkck

```
type(fgsl_odeiv2_step_type), parameter, public fgsl::fgsl_odeiv2_step_rkck = fgsl_odeiv2_step_type(4)
```

47.1.1.363 fgsl_odeiv2_step_rkf45

```
type(fgsl_odeiv2_step_type), parameter, public fgsl::fgsl_odeiv2_step_rkf45 = fgsl_odeiv2_step_type(3)
```

47.1.1.364 fgsl_odeiv_hadj_dec

```
integer(fgsl_int), parameter, public fgsl::fgsl_odeiv_hadj_dec = -1
```

47.1.1.365 fgsl_odeiv_hadj_inc

```
integer(fgsl_int), parameter, public fgsl::fgsl_odeiv_hadj_inc = 1
```

47.1.1.366 fgsl_odeiv_hadj_nil

```
integer(fgsl_int), parameter, public fgsl::fgsl_odeiv_hadj_nil = 0
```

47.1.1.367 fgsl_odeiv_step_bsimp

```
type(fgsl_odeiv_step_type), parameter, public fgsl::fgsl_odeiv_step_bsimp = fgsl_odeiv_step_type(9)
```

47.1.1.368 fgsl_odeiv_step_gear1

```
type(fgsl_odeiv_step_type), parameter, public fgsl::fgsl_odeiv_step_gear1 = fgsl_odeiv_step_type(10)
```

47.1.1.369 fgsl_odeiv_step_gear2

```
type(fgsl_odeiv_step_type), parameter, public fgsl::fgsl_odeiv_step_gear2 = fgsl_odeiv_step_type(11)
```

47.1.1.370 fgsl_odeiv_step_rk2

```
type(fgsl_odeiv_step_type), parameter, public fgsl::fgsl_odeiv_step_rk2 = fgsl_odeiv_step_type(1)
```

47.1.1.371 fgsl_odeiv_step_rk2imp

```
type(fgsl_odeiv_step_type), parameter, public fgsl::fgsl_odeiv_step_rk2imp = fgsl_odeiv_step_type(6)
```

47.1.1.372 fgsl_odeiv_step_rk2simp

```
type(fgsl_odeiv_step_type), parameter, public fgsl::fgsl_odeiv_step_rk2simp = fgsl_odeiv_step_type(7)
```

47.1.1.373 fgsl_odeiv_step_rk4

```
type(fgsl_odeiv_step_type), parameter, public fgsl::fgsl_odeiv_step_rk4 = fgsl_odeiv_step_type(2)
```

47.1.1.374 fgsl_odeiv_step_rk4imp

```
type(fgsl_odeiv_step_type), parameter, public fgsl::fgsl_odeiv_step_rk4imp = fgsl_odeiv_step_type(8)
```

47.1.1.375 fgsl_odeiv_step_rk8pd

```
type(fgsl_odeiv_step_type), parameter, public fgsl::fgsl_odeiv_step_rk8pd = fgsl_odeiv_step_type(5)
```

47.1.1.376 fgsl_odeiv_step_rkck

```
type(fgsl_odeiv_step_type), parameter, public fgsl::fgsl_odeiv_step_rkck = fgsl_odeiv_step_type(4)
```

47.1.1.377 fgsl_odeiv_step_rkf45

```
type(fgsl_odeiv_step_type), parameter, public fgsl::fgsl_odeiv_step_rkf45 = fgsl_odeiv_step_type(3)
```

47.1.1.378 fgsl_pathmax

```
integer, parameter, public fgsl::fgsl_pathmax = 2048
```

47.1.1.379 fgsl_prec_approx

```
type(fgsl_mode_t), parameter, public fgsl::fgsl_prec_approx = fgsl_mode_t(2)
```

47.1.1.380 fgsl_prec_double

```
type(fgsl_mode_t), parameter, public fgsl::fgsl_prec_double = fgsl_mode_t(0)
```

47.1.1.381 fgsl_prec_single

```
type(fgsl_mode_t), parameter, public fgsl::fgsl_prec_single = fgsl_mode_t(1)
```

47.1.1.382 fgsl_qrng_halton

```
type(fgsl_qrng_type), parameter, public fgsl::fgsl_qrng_halton = fgsl_qrng_type(3)
```

47.1.1.383 fgsl_qrng_niederreiter_2

```
type(fgsl_qrng_type), parameter, public fgsl::fgsl_qrng_niederreiter_2 = fgsl_qrng_type(1)
```

47.1.1.384 fgsl_qrng_reversehalton

```
type(fgsl_qrng_type), parameter, public fgsl::fgsl_qrng_reversehalton = fgsl_qrng_type(4)
```

47.1.1.385 fgsl_qrng_sobol

```
type(fgsl_qrng_type), parameter, public fgsl::fgsl_qrng_sobol = fgsl_qrng_type(2)
```

47.1.1.386 fgsl_rng_borosh13

```
type(fgsl_rng_type), public fgsl::fgsl_rng_borosh13 = fgsl_rng_type(c_null_ptr, 1)
```

47.1.1.387 fgsl_rng_cmrg

```
type(fgsl_rng_type), public fgsl::fgsl_rng_cmrg = fgsl_rng_type(c_null_ptr, 3)
```

47.1.1.388 fgsl_rng_coveyou

```
type(fgsl_rng_type), public fgsl::fgsl_rng_coveyou = fgsl_rng_type(c_null_ptr, 2)
```

47.1.1.389 fgsl_rng_default

```
type(fgsl_rng_type), public fgsl::fgsl_rng_default = fgsl_rng_type(c_null_ptr, -1)
```

47.1.1.390 fgsl_rng_default_seed

```
integer(fgsl_long), bind(C, name='gsl_rng_default_seed'), public fgsl::fgsl_rng_default_seed
```

47.1.1.391 fgsl_rng_fishman18

```
type(fgsl_rng_type), public fgsl::fgsl_rng_fishman18 = fgsl_rng_type(c_null_ptr, 4)
```

47.1.1.392 fgsl_rng_fishman20

```
type(fgsl_rng_type), public fgsl::fgsl_rng_fishman20 = fgsl_rng_type(c_null_ptr, 5)
```

47.1.1.393 fgsl_rng_fishman2x

```
type(fgsl_rng_type), public fgsl::fgsl_rng_fishman2x = fgsl_rng_type(c_null_ptr, 6)
```

47.1.1.394 fgsl_rng_gfsr4

```
type(fgsl_rng_type), public fgsl::fgsl_rng_gfsr4 = fgsl_rng_type(c_null_ptr, 7)
```

47.1.1.395 fgsl_rng_knuthran

```
type(fgsl_rng_type), public fgsl::fgsl_rng_knuthran = fgsl_rng_type(c_null_ptr, 8)
```

47.1.1.396 fgsl_rng_knuthran2

```
type(fgsl_rng_type), public fgsl::fgsl_rng_knuthran2 = fgsl_rng_type(c_null_ptr, 9)
```

47.1.1.397 fgsl_rng_knuthran2002

```
type(fgsl_rng_type), public fgsl::fgsl_rng_knuthran2002 = fgsl_rng_type(c_null_ptr, 62)
```

47.1.1.398 fgsl_rng_lecuyer21

```
type(fgsl_rng_type), public fgsl::fgsl_rng_lecuyer21 = fgsl_rng_type(c_null_ptr, 10)
```

47.1.1.399 fgsl_rng_minstd

```
type(fgsl_rng_type), public fgsl::fgsl_rng_minstd = fgsl_rng_type(c_null_ptr, 11)
```

47.1.1.400 fgsl_rng_mrg

```
type(fgsl_rng_type), public fgsl::fgsl_rng_mrg = fgsl_rng_type(c_null_ptr, 12)
```

47.1.1.401 fgsl_rng_mt19937

```
type(fgsl_rng_type), public fgsl::fgsl_rng_mt19937 = fgsl_rng_type(c_null_ptr, 13)
```

47.1.1.402 fgsl_rng_mt19937_1998

```
type(fgsl_rng_type), public fgsl::fgsl_rng_mt19937_1998 = fgsl_rng_type(c_null_ptr, 15)
```

47.1.1.403 fgsl_rng_mt19937_1999

```
type(fgsl_rng_type), public fgsl::fgsl_rng_mt19937_1999 = fgsl_rng_type(c_null_ptr, 14)
```

47.1.1.404 fgsl_rng_r250

```
type(fgsl_rng_type), public fgsl::fgsl_rng_r250 = fgsl_rng_type(c_null_ptr, 16)
```

47.1.1.405 fgsl_rng_ran0

```
type(fgsl_rng_type), public fgsl::fgsl_rng_ran0 = fgsl_rng_type(c_null_ptr, 17)
```

47.1.1.406 fgsl_rng_ran1

```
type(fgsl_rng_type), public fgsl::fgsl_rng_ran1 = fgsl_rng_type(c_null_ptr, 18)
```

47.1.1.407 fgsl_rng_ran2

```
type(fgsl_rng_type), public fgsl::fgsl_rng_ran2 = fgsl_rng_type(c_null_ptr, 19)
```

47.1.1.408 fgsl_rng_ran3

```
type(fgsl_rng_type), public fgsl::fgsl_rng_ran3 = fgsl_rng_type(c_null_ptr, 20)
```

47.1.1.409 fgsl_rng_rand

```
type(fgsl_rng_type), public fgsl::fgsl_rng_rand = fgsl_rng_type(c_null_ptr, 21)
```

47.1.1.410 fgsl_rng_rand48

```
type(fgsl_rng_type), public fgsl::fgsl_rng_rand48 = fgsl_rng_type(c_null_ptr, 22)
```

47.1.1.411 fgsl_rng_random128_bsd

```
type(fgsl_rng_type), public fgsl::fgsl_rng_random128_bsd = fgsl_rng_type(c_null_ptr, 23)
```

47.1.1.412 fgsl_rng_random128_glibc2

```
type(fgsl_rng_type), public fgsl::fgsl_rng_random128_glibc2 = fgsl_rng_type(c_null_ptr, 24)
```

47.1.1.413 fgsl_rng_random128_libc5

```
type(fgsl_rng_type), public fgsl::fgsl_rng_random128_libc5 = fgsl_rng_type(c_null_ptr, 25)
```

47.1.1.414 fgsl_rng_random256_bsd

```
type(fgsl_rng_type), public fgsl::fgsl_rng_random256_bsd = fgsl_rng_type(c_null_ptr, 26)
```

47.1.1.415 fgsl_rng_random256_glibc2

```
type(fgsl_rng_type), public fgsl::fgsl_rng_random256_glibc2 = fgsl_rng_type(c_null_ptr, 27)
```

47.1.1.416 fgsl_rng_random256_libc5

```
type(fgsl_rng_type), public fgsl::fgsl_rng_random256_libc5 = fgsl_rng_type(c_null_ptr, 28)
```

47.1.1.417 fgsl_rng_random32_bsd

```
type(fgsl_rng_type), public fgsl::fgsl_rng_random32_bsd = fgsl_rng_type(c_null_ptr, 29)
```

47.1.1.418 fgsl_rng_random32_glibc2

```
type(fgsl_rng_type), public fgsl::fgsl_rng_random32_glibc2 = fgsl_rng_type(c_null_ptr, 30)
```

47.1.1.419 fgsl_rng_random32_libc5

```
type(fgsl_rng_type), public fgsl::fgsl_rng_random32_libc5 = fgsl_rng_type(c_null_ptr, 31)
```

47.1.1.420 fgsl_rng_random64_bsd

```
type(fgsl_rng_type), public fgsl::fgsl_rng_random64_bsd = fgsl_rng_type(c_null_ptr, 32)
```

47.1.1.421 fgsl_rng_random64_glibc2

```
type(fgsl_rng_type), public fgsl::fgsl_rng_random64_glibc2 = fgsl_rng_type(c_null_ptr, 33)
```

47.1.1.422 fgsl_rng_random64_libc5

```
type(fgsl_rng_type), public fgsl::fgsl_rng_random64_libc5 = fgsl_rng_type(c_null_ptr, 34)
```

47.1.1.423 fgsl_rng_random8_bsd

```
type(fgsl_rng_type), public fgsl::fgsl_rng_random8_bsd = fgsl_rng_type(c_null_ptr, 35)
```

47.1.1.424 fgsl_rng_random8_glibc2

```
type(fgsl_rng_type), public fgsl::fgsl_rng_random8_glibc2 = fgsl_rng_type(c_null_ptr, 36)
```

47.1.1.425 fgsl_rng_random8_libc5

```
type(fgsl_rng_type), public fgsl::fgsl_rng_random8_libc5 = fgsl_rng_type(c_null_ptr, 37)
```

47.1.1.426 fgsl_rng_random_bsd

```
type(fgsl_rng_type), public fgsl::fgsl_rng_random_bsd = fgsl_rng_type(c_null_ptr, 38)
```

47.1.1.427 fgsl_rng_random_glibc2

```
type(fgsl_rng_type), public fgsl::fgsl_rng_random_glibc2 = fgsl_rng_type(c_null_ptr, 39)
```

47.1.1.428 fgsl_rng_random_libc5

```
type(fgsl_rng_type), public fgsl::fgsl_rng_random_libc5 = fgsl_rng_type(c_null_ptr, 40)
```

47.1.1.429 fgsl_rng_randu

```
type(fgsl_rng_type), public fgsl::fgsl_rng_randu = fgsl_rng_type(c_null_ptr, 41)
```

47.1.1.430 fgsl_rng_ranf

```
type(fgsl_rng_type), public fgsl::fgsl_rng_ranf = fgsl_rng_type(c_null_ptr, 42)
```

47.1.1.431 fgsl_rng_ranlux

```
type(fgsl_rng_type), public fgsl::fgsl_rng_ranlux = fgsl_rng_type(c_null_ptr, 43)
```

47.1.1.432 fgsl_rng_ranlux389

```
type(fgsl_rng_type), public fgsl::fgsl_rng_ranlux389 = fgsl_rng_type(c_null_ptr, 44)
```

47.1.1.433 fgsl_rng_ranlxd1

```
type(fgsl_rng_type), public fgsl::fgsl_rng_ranlxd1 = fgsl_rng_type(c_null_ptr, 45)
```

47.1.1.434 fgsl_rng_ranlxd2

```
type(fgsl_rng_type), public fgsl::fgsl_rng_ranlxd2 = fgsl_rng_type(c_null_ptr, 46)
```

47.1.1.435 fgsl_rng_ranlxs0

```
type(fgsl_rng_type), public fgsl::fgsl_rng_ranlxs0 = fgsl_rng_type(c_null_ptr, 47)
```

47.1.1.436 fgsl_rng_ranlxs1

```
type(fgsl_rng_type), public fgsl::fgsl_rng_ranlxs1 = fgsl_rng_type(c_null_ptr, 48)
```

47.1.1.437 fgsl_rng_ranlxs2

```
type(fgsl_rng_type), public fgsl::fgsl_rng_ranlxs2 = fgsl_rng_type(c_null_ptr, 49)
```

47.1.1.438 fgsl_rng_ranmar

```
type(fgsl_rng_type), public fgsl::fgsl_rng_ranmar = fgsl_rng_type(c_null_ptr, 50)
```

47.1.1.439 fgsl_rng_slatec

```
type(fgsl_rng_type), public fgsl::fgsl_rng_slatec = fgsl_rng_type(c_null_ptr, 51)
```

47.1.1.440 fgsl_rng_taus

```
type(fgsl_rng_type), public fgsl::fgsl_rng_taus = fgsl_rng_type(c_null_ptr, 52)
```

47.1.1.441 fgsl_rng_taus113

```
type(fgsl_rng_type), public fgsl::fgsl_rng_taus113 = fgsl_rng_type(c_null_ptr, 54)
```

47.1.1.442 fgsl_rng_taus2

```
type(fgsl_rng_type), public fgsl::fgsl_rng_taus2 = fgsl_rng_type(c_null_ptr, 53)
```

47.1.1.443 fgsl_rng_transputer

```
type(fgsl_rng_type), public fgsl::fgsl_rng_transputer = fgsl_rng_type(c_null_ptr, 55)
```

47.1.1.444 fgsl_rng_tt800

```
type(fgsl_rng_type), public fgsl::fgsl_rng_tt800 = fgsl_rng_type(c_null_ptr, 56)
```

47.1.1.445 fgsl_rng_uni

```
type(fgsl_rng_type), public fgsl::fgsl_rng_uni = fgsl_rng_type(c_null_ptr, 57)
```

47.1.1.446 fgsl_rng_uni32

```
type(fgsl_rng_type), public fgsl::fgsl_rng_uni32 = fgsl_rng_type(c_null_ptr, 58)
```

47.1.1.447 fgsl_rng_vax

```
type(fgsl_rng_type), public fgsl::fgsl_rng_vax = fgsl_rng_type(c_null_ptr, 59)
```

47.1.1.448 fgsl_rng_waterman14

```
type(fgsl_rng_type), public fgsl::fgsl_rng_waterman14 = fgsl_rng_type(c_null_ptr, 60)
```

47.1.1.449 fgsl_rng_zuf

```
type(fgsl_rng_type), public fgsl::fgsl_rng_zuf = fgsl_rng_type(c_null_ptr, 61)
```

47.1.1.450 fgsl_root_fdfsolver_newton

```
type(fgsl_root_fdfsolver_type), parameter, public fgsl::fgsl_root_fdfsolver_newton = fgsl_root_fdfsolver_type(
```

47.1.1.451 fgsl_root_fdfsolver_secant

```
type(fgsl_root_fdfsolver_type), parameter, public fgsl::fgsl_root_fdfsolver_secant = fgsl_root_fdfsolver_type(
```

47.1.1.452 fgsl_root_fdfsolver_steffenson

```
type(fgsl_root_fdfsolver_type), parameter, public fgsl::fgsl_root_fdfsolver_steffenson = fgsl_root_fdfsolver_t
```

47.1.1.453 fgsl_root_fsolver_bisection

```
type(fgsl_root_fsolver_type), parameter, public fgsl::fgsl_root_fsolver_bisection = fgsl_root_fsolver_type(1)
```

47.1.1.454 fgsl_root_fsolver_brent

```
type(fgsl_root_fsolver_type), parameter, public fgsl::fgsl_root_fsolver_brent = fgsl_root_fsolver_type(2)
```

47.1.1.455 fgsl_root_fsolver_falsepos

```
type(fgsl_root_fsolver_type), parameter, public fgsl::fgsl_root_fsolver_falsepos = fgsl_root_fsolver_type(3)
```

47.1.1.456 fgsl_sf_legendre_full

```
type(fgsl_sf_legendre_t), parameter, public fgsl::fgsl_sf_legendre_full = fgsl_sf_legendre_t(2)
```

47.1.1.457 fgsl_sf_legendre_none

```
type(fgsl_sf_legendre_t), parameter, public fgsl::fgsl_sf_legendre_none = fgsl_sf_legendre_t(3)
```

47.1.1.458 fgsl_sf_legendre_schmidt

```
type(fgsl_sf_legendre_t), parameter, public fgsl::fgsl_sf_legendre_schmidt = fgsl_sf_legendre_t(0)
```

47.1.1.459 fgsl_sf_legendre_spharm

```
type(fgsl_sf_legendre_t), parameter, public fgsl::fgsl_sf_legendre_spharm = fgsl_sf_legendre_t(1)
```

47.1.1.460 fgsl_size_t

```
integer, parameter, public fgsl::fgsl_size_t = c_size_t
```

47.1.1.461 fgsl_splinalg_itersolve_gmres

```
type(fgsl_splinalg_itersolve_type), parameter, public fgsl::fgsl_splinalg_itersolve_gmres =
fgsl_splinalg_itersolve_type(1)
```

47.1.1.462 fgsl_spmatrix_ccs

```
integer(fgsl_size_t), parameter, public fgsl::fgsl_spmatrix_ccs = 1
```

47.1.1.463 fgsl_spmatrix_triplet

```
integer(fgsl_size_t), parameter, public fgsl::fgsl_spmatrix_triplet = 0
```

47.1.1.464 fgsl_strmax

```
integer, parameter, public fgsl::fgsl_strmax = 128
```

47.1.1.465 fgsl_success

```
integer(fgsl_int), parameter, public fgsl::fgsl_success = 0
```

47.1.1.466 fgsl_vegas_mode_importance

```
integer(c_int), parameter, public fgsl::fgsl_vegas_mode_importance = 1
```

47.1.1.467 fgsl_vegas_mode_importance_only

```
integer(c_int), parameter, public fgsl::fgsl_vegas_mode_importance_only = 0
```

47.1.1.468 fgsl_vegas_mode_stratified

```
integer(c_int), parameter, public fgsl::fgsl_vegas_mode_stratified = -1
```

47.1.1.469 fgsl_version

```
character(kind=fgsl_char, len=*), parameter, public fgsl::fgsl_version =PACKAGE_VERSION
```

47.1.1.470 fgsl_wavelet_bspline

```
type(fgsl_wavelet_type), parameter, public fgsl::fgsl_wavelet_bspline = fgsl_wavelet_type(5)
```

47.1.1.471 fgsl_wavelet_bspline_centered

```
type(fgsl_wavelet_type), parameter, public fgsl::fgsl_wavelet_bspline_centered = fgsl_wavelet_type(6)
```

47.1.1.472 fgsl_wavelet_daubechies

```
type(fgsl_wavelet_type), parameter, public fgsl::fgsl_wavelet_daubechies = fgsl_wavelet_type(1)
```

47.1.1.473 fgsl_wavelet_daubechies_centered

```
type(fgsl_wavelet_type), parameter, public fgsl::fgsl_wavelet_daubechies_centered = fgsl_wavelet_type(2)
```

47.1.1.474 fgsl_wavelet_haar

```
type(fgsl_wavelet_type), parameter, public fgsl::fgsl_wavelet_haar = fgsl_wavelet_type(3)
```

47.1.1.475 fgsl_wavelet_haar_centered

```
type(fgsl_wavelet_type), parameter, public fgsl::fgsl_wavelet_haar_centered = fgsl_wavelet_type(4)
```

47.1.1.476 gsl_sf_legendre_full

```
integer(fgsl_int), parameter, public fgsl::gsl_sf_legendre_full = 2
```

47.1.1.477 gsl_sf_legendre_none

```
integer(fgsl_int), parameter, public fgsl::gsl_sf_legendre_none = 3
```

47.1.1.478 gsl_sf_legendre_schmidt

```
integer(fgsl_int), parameter, public fgsl::gsl_sf_legendre_schmidt = 0
```

47.1.1.479 gsl_sf_legendre_spharm

```
integer(fgsl_int), parameter, public fgsl::gsl_sf_legendre_spharm = 1
```

47.1.1.480 m_1_pi

```
real(fgsl_extended), parameter, public fgsl::m_1_pi = 0.31830988618379067153776752675_fgsl_↩
extended
```

47.1.1.481 m_2_pi

```
real(fgsl_extended), parameter, public fgsl::m_2_pi = 0.63661977236758134307553505349_fgsl_↩
extended
```

47.1.1.482 m_2_sqrtpi

```
real(fgsl_extended), parameter, public fgsl::m_2_sqrtpi = 1.12837916709551257389615890312_↩
fgsl_extended
```

47.1.1.483 m_e

```
real(fgsl_extended), parameter, public fgsl::m_e = 2.71828182845904523536028747135_fgsl_↩
extended
```

47.1.1.484 m_euler

```
real(fgsl_extended), parameter, public fgsl::m_euler = 0.57721566490153286060651209008_fgsl_↩
extended
```

47.1.1.485 m_ln10

```
real(fgsl_extended), parameter, public fgsl::m_ln10 = 2.30258509299404568401799145468_fgsl_↩
extended
```

47.1.1.486 m_ln2

```
real(fgsl_extended), parameter, public fgsl::m_ln2 = 0.69314718055994530941723212146_fgsl_↩
extended
```

47.1.1.487 m_lnpi

```
real(fgsl_extended), parameter, public fgsl::m_lnpi = 1.14472988584940017414342735135_fgsl_↩
extended
```

47.1.1.488 m_log10e

```
real(fgsl_extended), parameter, public fgsl::m_log10e = 0.434294481903251827651128918 92_fgsl↩
_extended
```

47.1.1.489 m_log2e

```
real(fgsl_extended), parameter, public fgsl::m_log2e = 1.442695040888963407359924681 00_fgsl_↩
extended
```

47.1.1.490 m_pi

```
real(fgsl_extended), parameter, public fgsl::m_pi = 3.141592653589793238462643383 28_fgsl_↩
extended
```

47.1.1.491 m_pi_2

```
real(fgsl_extended), parameter, public fgsl::m_pi_2 = 1.570796326794896619231321691 64_fgsl_↩
extended
```

47.1.1.492 m_pi_4

```
real(fgsl_extended), parameter, public fgsl::m_pi_4 = 0.785398163397448309615660845 82_fgsl_↩
extended
```

47.1.1.493 m_sqrt1_2

```
real(fgsl_extended), parameter, public fgsl::m_sqrt1_2 = 0.707106781186547524400844362 10_↩
fgsl_extended
```

47.1.1.494 m_sqrt2

```
real(fgsl_extended), parameter, public fgsl::m_sqrt2 = 1.414213562373095048801688724 21_fgsl_↩
extended
```

47.1.1.495 m_sqrt3

```
real(fgsl_extended), parameter, public fgsl::m_sqrt3 = 1.732050807568877293527446341 51_fgsl_↩
extended
```

47.1.1.496 m_sqrtpi

```
real(fgsl_extended), parameter, public fgsl::m_sqrtpi = 1.772453850905516027298167483 34_fgsl↩
_extended
```

Chapter 48

Data Type Documentation

48.1 assignment(=) Interface Reference

Public Member Functions

- fgsl_complex_to_complex
- complex_to_fgsl_complex
- gsl_sf_to_fgsl_sf
- gsl_sfe10_to_fgsl_sfe10
- fgsl_vector_to_array
- fgsl_vector_complex_to_array
- fgsl_matrix_to_array
- fgsl_matrix_complex_to_array

48.1.1 Member Function/Subroutine Documentation

48.1.1.1 complex_to_fgsl_complex()

```
assignment(=)::complex_to_fgsl_complex
```

48.1.1.2 fgsl_complex_to_complex()

```
assignment(=)::fgsl_complex_to_complex
```

48.1.1.3 fgsl_matrix_complex_to_array()

```
assignment(=)::fgsl_matrix_complex_to_array
```

48.1.1.4 fgsl_matrix_to_array()

`assignment(=)::fgsl_matrix_to_array`

48.1.1.5 fgsl_vector_complex_to_array()

`assignment(=)::fgsl_vector_complex_to_array`

48.1.1.6 fgsl_vector_to_array()

`assignment(=)::fgsl_vector_to_array`

48.1.1.7 gsl_sf_to_fgsl_sf()

`assignment(=)::gsl_sf_to_fgsl_sf`

48.1.1.8 gsl_sfe10_to_fgsl_sfe10()

`assignment(=)::gsl_sfe10_to_fgsl_sfe10`

The documentation for this interface was generated from the following file:

- interface/generics.finc

48.2 fgsl::fgsl_bspline_workspace Type Reference

Public Attributes

- type(c_ptr) gsl_bspline_workspace = c_null_ptr

48.2.1 Member Data Documentation

48.2.1.1 gsl_bspline_workspace

```
type(c_ptr) fgsl::fgsl_bspline_workspace::gsl_bspline_workspace = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.3 fgsl::fgsl_cheb_series Type Reference

Public Attributes

- type(c_ptr) gsl_cheb_series = c_null_ptr

48.3.1 Member Data Documentation

48.3.1.1 gsl_cheb_series

```
type(c_ptr) fgsl::fgsl_cheb_series::gsl_cheb_series = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.4 fgsl::fgsl_combination Type Reference

Public Attributes

- type(c_ptr) gsl_combination = c_null_ptr

48.4.1 Member Data Documentation

48.4.1.1 gsl_combination

```
type(c_ptr) fgsl::fgsl_combination::gsl_combination = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.5 fgsl::fgsl_dht Type Reference

Public Attributes

- type(c_ptr) gsl_dht = c_null_ptr

48.5.1 Member Data Documentation

48.5.1.1 gsl_dht

```
type(c_ptr) fgsl::fgsl_dht::gsl_dht = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.6 fgsl::fgsl_eigen_gen_workspace Type Reference

Public Attributes

- type(c_ptr) gsl_eigen_gen_workspace = c_null_ptr

48.6.1 Member Data Documentation

48.6.1.1 gsl_eigen_gen_workspace

```
type(c_ptr) fgsl::fgsl_eigen_gen_workspace::gsl_eigen_gen_workspace = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.7 fgsl::fgsl_eigen_genherm_workspace Type Reference

Public Attributes

- type(c_ptr) gsl_eigen_genherm_workspace = c_null_ptr

48.7.1 Member Data Documentation

48.7.1.1 gsl_eigen_genherm_workspace

```
type(c_ptr) fgsl::fgsl_eigen_genherm_workspace::gsl_eigen_genherm_workspace = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.8 fgsl::fgsl_eigen_genhermv_workspace Type Reference

Public Attributes

- type(c_ptr) gsl_eigen_genhermv_workspace = c_null_ptr

48.8.1 Member Data Documentation

48.8.1.1 gsl_eigen_genhermv_workspace

```
type(c_ptr) fgsl::fgsl_eigen_genhermv_workspace::gsl_eigen_genhermv_workspace = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.9 fgsl::fgsl_eigen_gensymm_workspace Type Reference

Public Attributes

- type(c_ptr) gsl_eigen_gensymm_workspace = c_null_ptr

48.9.1 Member Data Documentation

48.9.1.1 gsl_eigen_gensymm_workspace

```
type(c_ptr) fgsl::fgsl_eigen_gensymm_workspace::gsl_eigen_gensymm_workspace = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.10 fgsl::fgsl_eigen_gensymmv_workspace Type Reference

Public Attributes

- type(c_ptr) gsl_eigen_gensymmv_workspace = c_null_ptr

48.10.1 Member Data Documentation

48.10.1.1 gsl_eigen_gensymmv_workspace

```
type(c_ptr) fgsl::fgsl_eigen_gensymmv_workspace::gsl_eigen_gensymmv_workspace = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.11 fgsl::fgsl_eigen_genv_workspace Type Reference

Public Attributes

- type(c_ptr) gsl_eigen_genv_workspace = c_null_ptr

48.11.1 Member Data Documentation

48.11.1.1 gsl_eigen_genv_workspace

```
type(c_ptr) fgsl::fgsl_eigen_genv_workspace::gsl_eigen_genv_workspace = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.12 fgsl::fgsl_eigen_herm_workspace Type Reference

Public Attributes

- type(c_ptr) gsl_eigen_herm_workspace = c_null_ptr

48.12.1 Member Data Documentation

48.12.1.1 gsl_eigen_herm_workspace

```
type(c_ptr) fgsl::fgsl_eigen_herm_workspace::gsl_eigen_herm_workspace = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.13 fgsl::fgsl_eigen_hermv_workspace Type Reference

Public Attributes

- type(c_ptr) gsl_eigen_hermv_workspace = c_null_ptr

48.13.1 Member Data Documentation

48.13.1.1 gsl_eigen_hermv_workspace

```
type(c_ptr) fgsl::fgsl_eigen_hermv_workspace::gsl_eigen_hermv_workspace = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.14 fgsl::fgsl_eigen_nonsymm_workspace Type Reference

Public Attributes

- type(c_ptr) gsl_eigen_nonsymm_workspace = c_null_ptr

48.14.1 Member Data Documentation

48.14.1.1 gsl_eigen_nonsymm_workspace

```
type(c_ptr) fgsl::fgsl_eigen_nonsymm_workspace::gsl_eigen_nonsymm_workspace = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.15 fgsl::fgsl_eigen_nonsymmv_workspace Type Reference

Public Attributes

- type(c_ptr) gsl_eigen_nonsymmv_workspace = c_null_ptr

48.15.1 Member Data Documentation

48.15.1.1 gsl_eigen_nonsymmv_workspace

```
type(c_ptr) fgsl::fgsl_eigen_nonsymmv_workspace::gsl_eigen_nonsymmv_workspace = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.16 fgsl::fgsl_eigen_symm_workspace Type Reference

Public Attributes

- type(c_ptr) gsl_eigen_symm_workspace = c_null_ptr

48.16.1 Member Data Documentation

48.16.1.1 gsl_eigen_symm_workspace

```
type(c_ptr) fgsl::fgsl_eigen_symm_workspace::gsl_eigen_symm_workspace = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.17 fgsl::fgsl_eigen_symmv_workspace Type Reference

Public Attributes

- type(c_ptr) gsl_eigen_symmv_workspace = c_null_ptr

48.17.1 Member Data Documentation

48.17.1.1 gsl_eigen_symmv_workspace

```
type(c_ptr) fgsl::fgsl_eigen_symmv_workspace::gsl_eigen_symmv_workspace = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.18 fgsl::fgsl_error_handler_t Type Reference

Public Attributes

- type(c_funptr) gsl_error_handler_t = c_null_funptr

48.18.1 Member Data Documentation

48.18.1.1 gsl_error_handler_t

```
type(c_funptr) fgsl::fgsl_error_handler_t::gsl_error_handler_t = c_null_funptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.19 fgsl::fgsl_fft_complex_wavetable Type Reference

Public Attributes

- type(c_ptr) gsl_fft_complex_wavetable = c_null_ptr

48.19.1 Member Data Documentation

48.19.1.1 gsl_fft_complex_wavetable

```
type(c_ptr) fgsl::fgsl_fft_complex_wavetable::gsl_fft_complex_wavetable = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.20 fgsl::fgsl_fft_complex_workspace Type Reference

Public Attributes

- type(c_ptr) gsl_fft_complex_workspace = c_null_ptr

48.20.1 Member Data Documentation

48.20.1.1 gsl_fft_complex_workspace

```
type(c_ptr) fgsl::fgsl_fft_complex_workspace::gsl_fft_complex_workspace = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.21 fgsl::fgsl_fft_halfcomplex_wavetable Type Reference

Public Attributes

- type(c_ptr) gsl_fft_halfcomplex_wavetable = c_null_ptr

48.21.1 Member Data Documentation

48.21.1.1 gsl_fft_halfcomplex_wavetable

```
type(c_ptr) fgsl::fgsl_fft_halfcomplex_wavetable::gsl_fft_halfcomplex_wavetable = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.22 fgsl::fgsl_fft_real_wavetable Type Reference

Public Attributes

- type(c_ptr) gsl_fft_real_wavetable = c_null_ptr

48.22.1 Member Data Documentation

48.22.1.1 gsl_fft_real_wavetable

```
type(c_ptr) fgsl::fgsl_fft_real_wavetable::gsl_fft_real_wavetable = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.23 fgsl::fgsl_fft_real_workspace Type Reference

Public Attributes

- type(c_ptr) gsl_fft_real_workspace = c_null_ptr

48.23.1 Member Data Documentation

48.23.1.1 gsl_fft_real_workspace

```
type(c_ptr) fgsl::fgsl_fft_real_workspace::gsl_fft_real_workspace = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.24 fgsl::fgsl_file Type Reference

Public Attributes

- type(c_ptr) gsl_file = c_null_ptr

48.24.1 Member Data Documentation

48.24.1.1 gsl_file

```
type(c_ptr) fgsl::fgsl_file::gsl_file = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.25 fgsl::fgsl_filter_gaussian_workspace Type Reference

Public Attributes

- type(c_ptr) gsl_filter_gaussian_workspace

48.25.1 Member Data Documentation

48.25.1.1 gsl_filter_gaussian_workspace

```
type(c_ptr) fgsl::fgsl_filter_gaussian_workspace::gsl_filter_gaussian_workspace
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.26 fgsl::fgsl_filter_impulse_workspace Type Reference

Public Attributes

- type(c_ptr) gsl_filter_impulse_workspace

48.26.1 Member Data Documentation

48.26.1.1 gsl_filter_impulse_workspace

```
type(c_ptr) fgsl::fgsl_filter_impulse_workspace::gsl_filter_impulse_workspace
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.27 fgsl::fgsl_filter_median_workspace Type Reference

Public Attributes

- type(c_ptr) gsl_filter_median_workspace

48.27.1 Member Data Documentation

48.27.1.1 gsl_filter_median_workspace

```
type(c_ptr) fgsl::fgsl_filter_median_workspace::gsl_filter_median_workspace
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.28 fgsl::fgsl_filter_rmedian_workspace Type Reference

Public Attributes

- type(c_ptr) gsl_filter_rmedian_workspace

48.28.1 Member Data Documentation

48.28.1.1 gsl_filter_rmedian_workspace

```
type(c_ptr) fgsl::fgsl_filter_rmedian_workspace::gsl_filter_rmedian_workspace
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.29 fgsl::fgsl_function Type Reference

Public Attributes

- type(c_ptr) gsl_function = c_null_ptr

48.29.1 Member Data Documentation

48.29.1.1 gsl_function

```
type(c_ptr) fgsl::fgsl_function::gsl_function = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.30 fgsl::fgsl_function_fdf Type Reference

Public Attributes

- type(c_ptr) gsl_function_fdf = c_null_ptr

48.30.1 Member Data Documentation

48.30.1.1 gsl_function_fdf

```
type(c_ptr) fgsl::fgsl_function_fdf::gsl_function_fdf = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.31 fgsl::fgsl_histogram Type Reference

Public Attributes

- type(c_ptr) gsl_histogram = c_null_ptr

48.31.1 Member Data Documentation

48.31.1.1 gsl_histogram

```
type(c_ptr) fgsl::fgsl_histogram::gsl_histogram = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.32 fgsl::fgsl_histogram2d Type Reference

Public Attributes

- type(c_ptr) gsl_histogram2d = c_null_ptr

48.32.1 Member Data Documentation

48.32.1.1 gsl_histogram2d

```
type(c_ptr) fgsl::fgsl_histogram2d::gsl_histogram2d = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.33 fgsl::fgsl_histogram2d_pdf Type Reference

Public Attributes

- type(c_ptr) gsl_histogram2d_pdf = c_null_ptr

48.33.1 Member Data Documentation

48.33.1.1 gsl_histogram2d_pdf

```
type(c_ptr) fgsl::fgsl_histogram2d_pdf::gsl_histogram2d_pdf = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.34 fgsl::fgsl_histogram_pdf Type Reference

Public Attributes

- type(c_ptr) gsl_histogram_pdf = c_null_ptr

48.34.1 Member Data Documentation

48.34.1.1 gsl_histogram_pdf

```
type(c_ptr) fgsl::fgsl_histogram_pdf::gsl_histogram_pdf = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.35 fgsl_ieee_fprintf Interface Reference

Public Member Functions

- fgsl_ieee_fprintf_float
- fgsl_ieee_fprintf_double

48.35.1 Member Function/Subroutine Documentation

48.35.1.1 fgsl_ieee_fprintf_double()

`fgsl_ieee_fprintf::fgsl_ieee_fprintf_double`

48.35.1.2 fgsl_ieee_fprintf_float()

`fgsl_ieee_fprintf::fgsl_ieee_fprintf_float`

The documentation for this interface was generated from the following file:

- interface/generics.finc

48.36 fgsl_ieee_printf Interface Reference

Public Member Functions

- fgsl_ieee_printf_float
- fgsl_ieee_printf_double

48.36.1 Member Function/Subroutine Documentation

48.36.1.1 fgsl_ieee_printf_double()

`fgsl_ieee_printf::fgsl_ieee_printf_double`

48.36.1.2 fgsl_ieee_printf_float()

`fgsl_ieee_printf::fgsl_ieee_printf_float`

The documentation for this interface was generated from the following file:

- interface/generics.finc

48.37 fgsl::fgsl_integration_cquad_workspace Type Reference

Public Attributes

- type(c_ptr) gsl_integration_cquad_workspace = c_null_ptr

48.37.1 Member Data Documentation

48.37.1.1 gsl_integration_cquad_workspace

```
type(c_ptr) fgsl::fgsl_integration_cquad_workspace::gsl_integration_cquad_workspace = c_null↩
_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.38 fgsl::fgsl_integration_fixed_workspace Type Reference

Public Attributes

- type(c_ptr) gsl_integration_fixed_workspace = c_null_ptr

48.38.1 Member Data Documentation

48.38.1.1 gsl_integration_fixed_workspace

```
type(c_ptr) fgsl::fgsl_integration_fixed_workspace::gsl_integration_fixed_workspace = c_null↩
_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.39 fgsl::fgsl_integration_glfixed_table Type Reference

Public Attributes

- type(c_ptr) gsl_integration_glfixed_table = c_null_ptr

48.39.1 Member Data Documentation

48.39.1.1 gsl_integration_glfixed_table

```
type(c_ptr) fgsl::fgsl_integration_glfixed_table::gsl_integration_glfixed_table = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.40 fgsl::fgsl_integration_qawo_table Type Reference

Public Attributes

- type(c_ptr) gsl_integration_qawo_table = c_null_ptr

48.40.1 Member Data Documentation

48.40.1.1 gsl_integration_qawo_table

```
type(c_ptr) fgsl::fgsl_integration_qawo_table::gsl_integration_qawo_table = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.41 fgsl::fgsl_integration_qaws_table Type Reference

Public Attributes

- type(c_ptr) gsl_integration_qaws_table = c_null_ptr

48.41.1 Member Data Documentation

48.41.1.1 gsl_integration_qaws_table

```
type(c_ptr) fgsl::fgsl_integration_qaws_table::gsl_integration_qaws_table = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.42 fgsl::fgsl_integration_romberg_workspace Type Reference

Public Attributes

- type(c_ptr) gsl_integration_romberg_workspace = c_null_ptr

48.42.1 Member Data Documentation

48.42.1.1 gsl_integration_romberg_workspace

```
type(c_ptr) fgsl::fgsl_integration_romberg_workspace::gsl_integration_romberg_workspace = c_↩
null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.43 fgsl::fgsl_integration_workspace Type Reference

Public Attributes

- type(c_ptr) gsl_integration_workspace = c_null_ptr

48.43.1 Member Data Documentation

48.43.1.1 gsl_integration_workspace

```
type(c_ptr) fgsl::fgsl_integration_workspace::gsl_integration_workspace = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.44 fgsl::fgsl_interp Type Reference

Public Attributes

- type(c_ptr) gsl_interp = c_null_ptr

48.44.1 Member Data Documentation

48.44.1.1 gsl_interp

```
type(c_ptr) fgsl::fgsl_interp::gsl_interp = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.45 fgsl::fgsl_interp2d Type Reference

Public Attributes

- type(c_ptr) gsl_interp2d = c_null_ptr

48.45.1 Member Data Documentation

48.45.1.1 gsl_interp2d

```
type(c_ptr) fgsl::fgsl_interp2d::gsl_interp2d = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.46 fgsl::fgsl_interp2d_type Type Reference

Public Attributes

- integer(fgsl_int) which = 0

48.46.1 Member Data Documentation

48.46.1.1 which

```
integer(fgsl_int) fgsl::fgsl_interp2d_type::which = 0
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.47 fgsl::fgsl_interp_accel Type Reference

Public Attributes

- type(c_ptr) gsl_interp_accel = c_null_ptr

48.47.1 Member Data Documentation

48.47.1.1 gsl_interp_accel

```
type(c_ptr) fgsl::fgsl_interp_accel::gsl_interp_accel = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.48 fgsl::fgsl_interp_type Type Reference

Public Attributes

- integer(fgsl_int) which = 0

48.48.1 Member Data Documentation

48.48.1.1 which

```
integer(fgsl_int) fgsl::fgsl_interp_type::which = 0
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.49 fgsl::fgsl_matrix Type Reference

Public Attributes

- type(c_ptr) gsl_matrix = c_null_ptr

48.49.1 Member Data Documentation

48.49.1.1 gsl_matrix

```
type(c_ptr) fgsl::fgsl_matrix::gsl_matrix = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.50 fgsl_matrix_align Interface Reference

Public Member Functions

- fgsl_matrix_align
- fgsl_matrix_pointer_align
- fgsl_matrix_complex_align
- fgsl_matrix_complex_pointer_align

48.50.1 Constructor & Destructor Documentation

48.50.1.1 fgsl_matrix_align()

```
fgsl_matrix_align::fgsl_matrix_align
```

48.50.2 Member Function/Subroutine Documentation

48.50.2.1 fgsl_matrix_complex_align()

```
fgsl_matrix_align::fgsl_matrix_complex_align
```

48.50.2.2 fgsl_matrix_complex_pointer_align()

```
fgsl_matrix_align::fgsl_matrix_complex_pointer_align
```

48.50.2.3 fgsl_matrix_pointer_align()

```
fgsl_matrix_align::fgsl_matrix_pointer_align
```

The documentation for this interface was generated from the following file:

- interface/generics.finc

48.51 fgsl::fgsl_matrix_complex Type Reference

Public Attributes

- type(c_ptr) gsl_matrix_complex = c_null_ptr

48.51.1 Member Data Documentation

48.51.1.1 gsl_matrix_complex

```
type(c_ptr) fgsl::fgsl_matrix_complex::gsl_matrix_complex = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.52 fgsl_matrix_free Interface Reference

Public Member Functions

- fgsl_matrix_free
- fgsl_matrix_complex_free

48.52.1 Constructor & Destructor Documentation

48.52.1.1 fgsl_matrix_free()

```
fgsl_matrix_free::fgsl_matrix_free
```

48.52.2 Member Function/Subroutine Documentation

48.52.2.1 fgsl_matrix_complex_free()

```
fgsl_matrix_free::fgsl_matrix_complex_free
```

The documentation for this interface was generated from the following file:

- interface/generics.finc

48.53 fgsl_matrix_init Interface Reference

Public Member Functions

- fgsl_matrix_init
- fgsl_matrix_complex_init

48.53.1 Constructor & Destructor Documentation

48.53.1.1 fgsl_matrix_init()

```
fgsl_matrix_init::fgsl_matrix_init
```

48.53.2 Member Function/Subroutine Documentation

48.53.2.1 fgsl_matrix_complex_init()

```
fgsl_matrix_init::fgsl_matrix_complex_init
```

The documentation for this interface was generated from the following file:

- interface/generics.finc

48.54 fgsl::fgsl_min_fminimizer Type Reference

Public Attributes

- type(c_ptr) gsl_min_fminimizer = c_null_ptr

48.54.1 Member Data Documentation

48.54.1.1 gsl_min_fminimizer

```
type(c_ptr) fgsl::fgsl_min_fminimizer::gsl_min_fminimizer = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.55 fgsl::fgsl_min_fminimizer_type Type Reference

Public Attributes

- integer(c_int) which = 0

48.55.1 Member Data Documentation

48.55.1.1 which

```
integer(c_int) fgsl::fgsl_min_fminimizer_type::which = 0
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.56 fgsl::fgsl_mode_t Type Reference

Public Attributes

- integer(c_int) gsl_mode = 0

48.56.1 Member Data Documentation

48.56.1.1 gsl_mode

```
integer(c_int) fgsl::fgsl_mode_t::gsl_mode = 0
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.57 fgsl::fgsl_monte_function Type Reference

Public Attributes

- type(c_ptr) gsl_monte_function = c_null_ptr

48.57.1 Member Data Documentation

48.57.1.1 gsl_monte_function

```
type(c_ptr) fgsl::fgsl_monte_function::gsl_monte_function = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.58 fgsl::fgsl_monte_miser_state Type Reference

Public Attributes

- type(c_ptr) gsl_monte_miser_state = c_null_ptr

48.58.1 Member Data Documentation

48.58.1.1 gsl_monte_miser_state

```
type(c_ptr) fgsl::fgsl_monte_miser_state::gsl_monte_miser_state = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.59 fgsl::fgsl_monte_plain_state Type Reference

Public Attributes

- type(c_ptr) gsl_monte_plain_state = c_null_ptr

48.59.1 Member Data Documentation

48.59.1.1 gsl_monte_plain_state

```
type(c_ptr) fgsl::fgsl_monte_plain_state::gsl_monte_plain_state = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.60 fgsl::fgsl_monte_vegas_state Type Reference

Public Attributes

- type(c_ptr) gsl_monte_vegas_state = c_null_ptr

48.60.1 Member Data Documentation

48.60.1.1 gsl_monte_vegas_state

```
type(c_ptr) fgsl::fgsl_monte_vegas_state::gsl_monte_vegas_state = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.61 fgsl::fgsl_movstat_function Type Reference

fgsl_movstat_function interoperates with gsl_movstat_function

Public Attributes

- type(c_funptr) function
- type(c_ptr) params

48.61.1 Detailed Description

fgsl_movstat_function interoperates with gsl_movstat_function

48.61.2 Member Data Documentation

48.61.2.1 function

```
type(c_funptr) fgsl::fgsl_movstat_function::function
```

48.61.2.2 params

```
type(c_ptr) fgsl::fgsl_movstat_function::params
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.62 fgsl::fgsl_movstat_workspace Type Reference

Public Attributes

- type(c_ptr) gsl_movstat_workspace

48.62.1 Member Data Documentation

48.62.1.1 gsl_movstat_workspace

```
type(c_ptr) fgsl::fgsl_movstat_workspace::gsl_movstat_workspace
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.63 fgsl_multifit_eval_wdf Interface Reference

Public Member Functions

- fgsl_multifit_eval_wdf_wts
- fgsl_multifit_eval_wdf_nowts

48.63.1 Member Function/Subroutine Documentation

48.63.1.1 fgsl_multifit_eval_wdf_nowts()

```
fgsl_multifit_eval_wdf::fgsl_multifit_eval_wdf_nowts
```

48.63.1.2 fgsl_multifit_eval_wdf_wts()

```
fgsl_multifit_eval_wdf::fgsl_multifit_eval_wdf_wts
```

The documentation for this interface was generated from the following file:

- interface/generics.finc

48.64 fgsl_multifit_eval_wf Interface Reference

Public Member Functions

- fgsl_multifit_eval_wf_wts
- fgsl_multifit_eval_wf_nowts

48.64.1 Member Function/Subroutine Documentation

48.64.1.1 fgsl_multifit_eval_wf_nowts()

```
fgsl_multifit_eval_wf::fgsl_multifit_eval_wf_nowts
```

48.64.1.2 fgsl_multifit_eval_wf_wts()

```
fgsl_multifit_eval_wf::fgsl_multifit_eval_wf_wts
```

The documentation for this interface was generated from the following file:

- interface/generics.finc

48.65 fgsl::fgsl_multifit_fdfridge Type Reference

Public Attributes

- type(c_ptr) gsl_multifit_fdfridge = c_null_ptr

48.65.1 Member Data Documentation

48.65.1.1 gsl_multifit_fdfridge

```
type(c_ptr) fgsl::fgsl_multifit_fdfridge::gsl_multifit_fdfridge = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.66 fgsl::fgsl_multifit_fdfsolver Type Reference

Public Attributes

- type(c_ptr) gsl_multifit_fdfsolver = c_null_ptr

48.66.1 Member Data Documentation

48.66.1.1 gsl_multifit_fdfsolver

```
type(c_ptr) fgsl::fgsl_multifit_fdfsolver::gsl_multifit_fdfsolver = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.67 fgsl_multifit_fdfsolver_dif_df Interface Reference

Public Member Functions

- fgsl_multifit_fdfsolver_dif_df_wts
- fgsl_multifit_fdfsolver_dif_df_nowts

48.67.1 Member Function/Subroutine Documentation

48.67.1.1 fgsl_multifit_fdfsolver_dif_df_nowts()

```
fgsl_multifit_fdfsolver_dif_df::fgsl_multifit_fdfsolver_dif_df_nowts
```

48.67.1.2 fgsl_multifit_fdfsolver_dif_df_wts()

```
fgsl_multifit_fdfsolver_dif_df::fgsl_multifit_fdfsolver_dif_df_wts
```

The documentation for this interface was generated from the following file:

- interface/generics.finc

48.68 fgsl::fgsl_multifit_fdfsolver_type Type Reference

Public Attributes

- integer(c_int) which = 0

48.68.1 Member Data Documentation

48.68.1.1 which

```
integer(c_int) fgsl::fgsl_multifit_fdfsolver_type::which = 0
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.69 fgsl::fgsl_multifit_fsolver Type Reference

Public Attributes

- type(c_ptr) gsl_multifit_fsolver = c_null_ptr

48.69.1 Member Data Documentation

48.69.1.1 gsl_multifit_fsolver

```
type(c_ptr) fgsl::fgsl_multifit_fsolver::gsl_multifit_fsolver = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.70 fgsl::fgsl_multifit_fsolver_type Type Reference

Public Attributes

- integer(c_int) which = 0

48.70.1 Member Data Documentation

48.70.1.1 which

```
integer(c_int) fgsl::fgsl_multifit_fsolver_type::which = 0
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.71 fgsl::fgsl_multifit_function Type Reference

Public Attributes

- type(c_ptr) gsl_multifit_function = c_null_ptr

48.71.1 Member Data Documentation

48.71.1.1 gsl_multifit_function

```
type(c_ptr) fgsl::fgsl_multifit_function::gsl_multifit_function = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.72 fgsl::fgsl_multifit_function_fdf Type Reference

Public Attributes

- type(c_ptr) gsl_multifit_function_fdf = c_null_ptr

48.72.1 Member Data Documentation

48.72.1.1 gsl_multifit_function_fdf

```
type(c_ptr) fgsl::fgsl_multifit_function_fdf::gsl_multifit_function_fdf = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.73 fgsl::fgsl_multifit_linear_workspace Type Reference

Public Attributes

- type(c_ptr) gsl_multifit_linear_workspace = c_null_ptr

48.73.1 Member Data Documentation

48.73.1.1 gsl_multifit_linear_workspace

```
type(c_ptr) fgsl::fgsl_multifit_linear_workspace::gsl_multifit_linear_workspace = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.74 fgsl::fgsl_multifit_nlinear_fdf Type Reference

Public Attributes

- type(c_ptr) gsl_multifit_nlinear_fdf = c_null_ptr

48.74.1 Member Data Documentation

48.74.1.1 gsl_multifit_nlinear_fdf

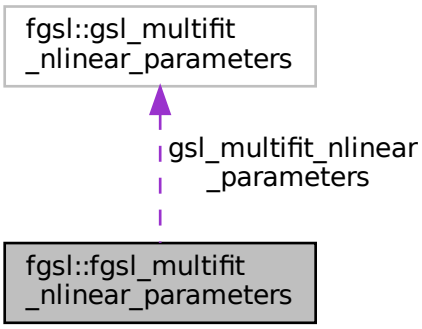
```
type(c_ptr) fgsl::fgsl_multifit_nlinear_fdf::gsl_multifit_nlinear_fdf = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.75 fgsl::fgsl_multifit_nlinear_parameters Type Reference

Collaboration diagram for fgsl::fgsl_multifit_nlinear_parameters:



Public Attributes

- type(gsl_multifit_nlinear_parameters) gsl_multifit_nlinear_parameters

48.75.1 Member Data Documentation

48.75.1.1 gsl_multifit_nlinear_parameters

```
type(gsl_multifit_nlinear_parameters) fgsl::fgsl_multifit_nlinear_parameters::gsl_multifit_↩
nlinear_parameters
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.76 fgsl_multifit_nlinear_type Interface Reference

Public Member Functions

- fgsl_multifit_nlinear_setup

48.76.1 Member Function/Subroutine Documentation

48.76.1.1 fgsl_multifit_nlinear_setup()

```
fgsl_multifit_nlinear_type::fgsl_multifit_nlinear_setup
```

The documentation for this interface was generated from the following file:

- interface/generics.finc

48.77 fgsl::fgsl_multifit_nlinear_type Type Reference

Public Attributes

- type(c_ptr) gsl_multifit_nlinear_type = c_null_ptr

48.77.1 Member Data Documentation

48.77.1.1 gsl_multifit_nlinear_type

```
type(c_ptr) fgsl::fgsl_multifit_nlinear_type::gsl_multifit_nlinear_type = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.78 fgsl::fgsl_multifit_nlinear_workspace Type Reference

Public Attributes

- type(c_ptr) gsl_multifit_nlinear_workspace = c_null_ptr

48.78.1 Member Data Documentation

48.78.1.1 gsl_multifit_nlinear_workspace

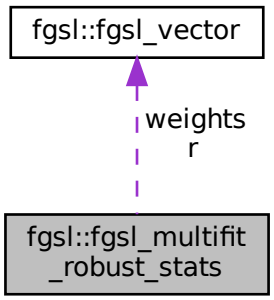
```
type(c_ptr) fgsl::fgsl_multifit_nlinear_workspace::gsl_multifit_nlinear_workspace = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.79 fgsl::fgsl_multifit_robust_stats Type Reference

Collaboration diagram for fgsl::fgsl_multifit_robust_stats:



Public Attributes

- real(fgsl_double) sigma_ols
- real(fgsl_double) sigma_mad
- real(fgsl_double) sigma_rob
- real(fgsl_double) sigma
- real(fgsl_double) rsq
- real(fgsl_double) adj_rsq
- real(fgsl_double) rmse
- real(fgsl_double) sse
- real(fgsl_double) dof
- real(fgsl_double) numit
- type(fgsl_vector) weights
- type(fgsl_vector) r

48.79.1 Member Data Documentation

48.79.1.1 adj_rsq

```
real(fgsl_double) fgsl::fgsl_multifit_robust_stats::adj_rsq
```

48.79.1.2 dof

```
real(fgsl_double) fgsl::fgsl_multifit_robust_stats::dof
```

48.79.1.3 numit

```
real(fgsl_double) fgsl::fgsl_multifit_robust_stats::numit
```

48.79.1.4 r

```
type(fgsl_vector) fgsl::fgsl_multifit_robust_stats::r
```

48.79.1.5 rmse

```
real(fgsl_double) fgsl::fgsl_multifit_robust_stats::rmse
```

48.79.1.6 rsq

```
real(fgsl_double) fgsl::fgsl_multifit_robust_stats::rsq
```

48.79.1.7 sigma

```
real(fgsl_double) fgsl::fgsl_multifit_robust_stats::sigma
```

48.79.1.8 sigma_mad

```
real(fgsl_double) fgsl::fgsl_multifit_robust_stats::sigma_mad
```

48.79.1.9 sigma_ols

```
real(fgsl_double) fgsl::fgsl_multifit_robust_stats::sigma_ols
```

48.79.1.10 sigma_rob

```
real(fgsl_double) fgsl::fgsl_multifit_robust_stats::sigma_rob
```

48.79.1.11 sse

```
real(fgsl_double) fgsl::fgsl_multifit_robust_stats::sse
```

48.79.1.12 weights

```
type(fgsl_vector) fgsl::fgsl_multifit_robust_stats::weights
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.80 fgsl::fgsl_multifit_robust_type Type Reference

Public Attributes

- integer(fgsl_int) which = 0

48.80.1 Member Data Documentation

48.80.1.1 which

```
integer(fgsl_int) fgsl::fgsl_multifit_robust_type::which = 0
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.81 fgsl::fgsl_multifit_robust_workspace Type Reference

Public Attributes

- type(c_ptr) gsl_multifit_robust_workspace

48.81.1 Member Data Documentation

48.81.1.1 gsl_multifit_robust_workspace

```
type(c_ptr) fgsl::fgsl_multifit_robust_workspace::gsl_multifit_robust_workspace
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.82 fgsl::fgsl_multilarge_linear_type Type Reference

Public Attributes

- integer(fgsl_int) which = 0

48.82.1 Member Data Documentation

48.82.1.1 which

```
integer(fgsl_int) fgsl::fgsl_multilarge_linear_type::which = 0
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.83 fgsl::fgsl_multilarge_linear_workspace Type Reference

Public Attributes

- type(c_ptr) gsl_multilarge_linear_workspace

48.83.1 Member Data Documentation

48.83.1.1 gsl_multilarge_linear_workspace

```
type(c_ptr) fgsl::fgsl_multilarge_linear_workspace::gsl_multilarge_linear_workspace
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.84 fgsl::fgsl_multilarge_nlinear_fdf Type Reference

Public Attributes

- type(c_ptr) gsl_multilarge_nlinear_fdf = c_null_ptr

48.84.1 Member Data Documentation

48.84.1.1 gsl_multilarge_nlinear_fdf

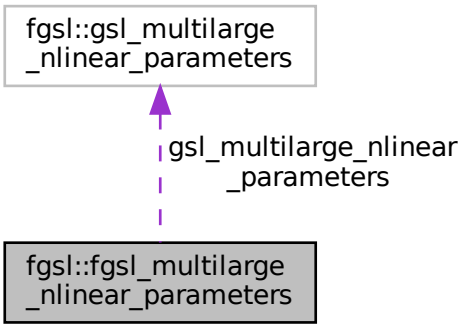
```
type(c_ptr) fgsl::fgsl_multilarge_nlinear_fdf::gsl_multilarge_nlinear_fdf = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.85 fgsl::fgsl_multilarge_nlinear_parameters Type Reference

Collaboration diagram for fgsl::fgsl_multilarge_nlinear_parameters:



Public Attributes

- type(gsl_multilarge_nlinear_parameters) gsl_multilarge_nlinear_parameters

48.85.1 Member Data Documentation

48.85.1.1 gsl_multilarge_nlinear_parameters

```
type(gsl_multilarge_nlinear_parameters) fgsl::fgsl_multilarge_nlinear_parameters::gsl_multilarge↩
_nlinear_parameters
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.86 fgsl_multilarge_nlinear_type Interface Reference

Public Member Functions

- fgsl_multilarge_nlinear_setup

48.86.1 Member Function/Subroutine Documentation

48.86.1.1 fgsl_multilarge_nlinear_setup()

```
fgsl_multilarge_nlinear_type::fgsl_multilarge_nlinear_setup
```

The documentation for this interface was generated from the following file:

- interface/generics.finc

48.87 fgsl::fgsl_multilarge_nlinear_type Type Reference

Public Attributes

- type(c_ptr) gsl_multilarge_nlinear_type = c_null_ptr

48.87.1 Member Data Documentation

48.87.1.1 gsl_multilarge_nlinear_type

```
type(c_ptr) fgsl::fgsl_multilarge_nlinear_type::gsl_multilarge_nlinear_type = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.88 fgsl::fgsl_multilarge_nlinear_workspace Type Reference

Public Attributes

- type(c_ptr) gsl_multilarge_nlinear_workspace = c_null_ptr

48.88.1 Member Data Documentation

48.88.1.1 gsl_multilarge_nlinear_workspace

```
type(c_ptr) fgsl::fgsl_multilarge_nlinear_workspace::gsl_multilarge_nlinear_workspace = c_↩
null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.89 fgsl::fgsl_multimin_fdfminimizer Type Reference

Public Attributes

- type(c_ptr) gsl_multimin_fdfminimizer = c_null_ptr

48.89.1 Member Data Documentation

48.89.1.1 gsl_multimin_fdfminimizer

```
type(c_ptr) fgsl::fgsl_multimin_fdfminimizer::gsl_multimin_fdfminimizer = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.90 fgsl::fgsl_multimin_fdfminimizer_type Type Reference

Public Attributes

- integer(c_int) which = 0

48.90.1 Member Data Documentation

48.90.1.1 which

```
integer(c_int) fgsl::fgsl_multimin_fdfminimizer_type::which = 0
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.91 fgsl::fgsl_multimin_fminimizer Type Reference

Public Attributes

- type(c_ptr) gsl_multimin_fminimizer = c_null_ptr

48.91.1 Member Data Documentation

48.91.1.1 gsl_multimin_fminimizer

```
type(c_ptr) fgsl::fgsl_multimin_fminimizer::gsl_multimin_fminimizer = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.92 fgsl::fgsl_multimin_fminimizer_type Type Reference

Public Attributes

- integer(c_int) which = 0

48.92.1 Member Data Documentation

48.92.1.1 which

```
integer(c_int) fgsl::fgsl_multimin_fminimizer_type::which = 0
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.93 fgsl::fgsl_multimin_function Type Reference

Public Attributes

- type(c_ptr) gsl_multimin_function = c_null_ptr

48.93.1 Member Data Documentation

48.93.1.1 gsl_multimin_function

```
type(c_ptr) fgsl::fgsl_multimin_function::gsl_multimin_function = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.94 fgsl::fgsl_multimin_function_fdf Type Reference

Public Attributes

- type(c_ptr) gsl_multimin_function_fdf = c_null_ptr

48.94.1 Member Data Documentation

48.94.1.1 gsl_multimin_function_fdf

```
type(c_ptr) fgsl::fgsl_multimin_function_fdf::gsl_multimin_function_fdf = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.95 fgsl::fgsl_multiroot_fdfsolver Type Reference

Public Attributes

- type(c_ptr) gsl_multiroot_fdfsolver = c_null_ptr

48.95.1 Member Data Documentation

48.95.1.1 gsl_multiroot_fdfsolver

```
type(c_ptr) fgsl::fgsl_multiroot_fdfsolver::gsl_multiroot_fdfsolver = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.96 fgsl::fgsl_multiroot_fdfsolver_type Type Reference

Public Attributes

- integer(c_int) which = 0

48.96.1 Member Data Documentation

48.96.1.1 which

```
integer(c_int) fgsl::fgsl_multiroot_fdfsolver_type::which = 0
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.97 fgsl::fgsl_multiroot_fsolver Type Reference

Public Attributes

- type(c_ptr) gsl_multiroot_fsolver = c_null_ptr

48.97.1 Member Data Documentation

48.97.1.1 gsl_multiroot_fsolver

```
type(c_ptr) fgsl::fgsl_multiroot_fsolver::gsl_multiroot_fsolver = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.98 fgsl::fgsl_multiroot_fsolver_type Type Reference

Public Attributes

- integer(c_int) which = 0

48.98.1 Member Data Documentation

48.98.1.1 which

```
integer(c_int) fgsl::fgsl_multiroot_fsolver_type::which = 0
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.99 fgsl::fgsl_multiroot_function Type Reference

Public Attributes

- type(c_ptr) gsl_multiroot_function = c_null_ptr

48.99.1 Member Data Documentation

48.99.1.1 gsl_multiroot_function

```
type(c_ptr) fgsl::fgsl_multiroot_function::gsl_multiroot_function = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.100 fgsl::fgsl_multiroot_function_fdf Type Reference

Public Attributes

- type(c_ptr) gsl_multiroot_function_fdf = c_null_ptr

48.100.1 Member Data Documentation

48.100.1.1 gsl_multiroot_function_fdf

```
type(c_ptr) fgsl::fgsl_multiroot_function_fdf::gsl_multiroot_function_fdf = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.101 fgsl::fgsl_multiset Type Reference

Public Attributes

- type(c_ptr) gsl_multiset = c_null_ptr

48.101.1 Member Data Documentation

48.101.1.1 gsl_multiset

```
type(c_ptr) fgsl::fgsl_multiset::gsl_multiset = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.102 fgsl::fgsl_nlinear_callback Interface Reference

The documentation for this interface was generated from the following file:

- fgsl.F90

48.103 fgsl::fgsl_ntuple Type Reference

Public Attributes

- type(c_ptr) gsl_ntuple = c_null_ptr

48.103.1 Member Data Documentation

48.103.1.1 gsl_ntuple

```
type(c_ptr) fgsl::fgsl_ntuple::gsl_ntuple = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.104 fgsl::fgsl_ntuple_select_fn Type Reference

Public Attributes

- type(c_ptr) gsl_ntuple_select_fn = c_null_ptr

48.104.1 Member Data Documentation

48.104.1.1 gsl_ntuple_select_fn

```
type(c_ptr) fgsl::fgsl_ntuple_select_fn::gsl_ntuple_select_fn = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.105 fgsl::fgsl_ntuple_value_fn Type Reference

Public Attributes

- type(c_ptr) gsl_ntuple_value_fn = c_null_ptr

48.105.1 Member Data Documentation

48.105.1.1 gsl_ntuple_value_fn

```
type(c_ptr) fgsl::fgsl_ntuple_value_fn::gsl_ntuple_value_fn = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.106 fgsl_obj_c_ptr Interface Reference

Public Member Functions

- fgsl_rng_c_ptr
- fgsl_vector_c_ptr
- fgsl_matrix_c_ptr

48.106.1 Member Function/Subroutine Documentation

48.106.1.1 fgsl_matrix_c_ptr()

```
fgsl_obj_c_ptr::fgsl_matrix_c_ptr
```

48.106.1.2 fgsl_rng_c_ptr()

```
fgsl_obj_c_ptr::fgsl_rng_c_ptr
```

48.106.1.3 fgsl_vector_c_ptr()

```
fgsl_obj_c_ptr::fgsl_vector_c_ptr
```

The documentation for this interface was generated from the following file:

- interface/generics.finc

48.107 fgsl::fgsl_odeiv2_control Type Reference

Public Attributes

- type(c_ptr) gsl_odeiv2_control = c_null_ptr

48.107.1 Member Data Documentation

48.107.1.1 gsl_odeiv2_control

```
type(c_ptr) fgsl::fgsl_odeiv2_control::gsl_odeiv2_control = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.108 fgsl::fgsl_odeiv2_control_type Type Reference

Public Attributes

- type(c_ptr) gsl_odeiv2_control_type = c_null_ptr

48.108.1 Member Data Documentation

48.108.1.1 gsl_odeiv2_control_type

```
type(c_ptr) fgsl::fgsl_odeiv2_control_type::gsl_odeiv2_control_type = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.109 fgsl::fgsl_odeiv2_driver Type Reference

Public Attributes

- type(c_ptr) gsl_odeiv2_driver = c_null_ptr

48.109.1 Member Data Documentation

48.109.1.1 gsl_odeiv2_driver

```
type(c_ptr) fgsl::fgsl_odeiv2_driver::gsl_odeiv2_driver = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.110 fgsl::fgsl_odeiv2_evolve Type Reference

Public Attributes

- type(c_ptr) gsl_odeiv2_evolve

48.110.1 Member Data Documentation

48.110.1.1 gsl_odeiv2_evolve

```
type(c_ptr) fgsl::fgsl_odeiv2_evolve::gsl_odeiv2_evolve
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.111 fgsl::fgsl_odeiv2_step Type Reference

Public Attributes

- type(c_ptr) gsl_odeiv2_step = c_null_ptr

48.111.1 Member Data Documentation

48.111.1.1 gsl_odeiv2_step

```
type(c_ptr) fgsl::fgsl_odeiv2_step::gsl_odeiv2_step = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.112 fgsl::fgsl_odeiv2_step_type Type Reference

Public Attributes

- integer(c_int) which = 0

48.112.1 Member Data Documentation

48.112.1.1 which

```
integer(c_int) fgsl::fgsl_odeiv2_step_type::which = 0
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.113 fgsl::fgsl_odeiv2_system Type Reference

Public Attributes

- type(c_ptr) gsl_odeiv2_system = c_null_ptr

48.113.1 Member Data Documentation

48.113.1.1 gsl_odeiv2_system

```
type(c_ptr) fgsl::fgsl_odeiv2_system::gsl_odeiv2_system = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.114 fgsl::fgsl_odeiv_control Type Reference

Public Attributes

- type(c_ptr) gsl_odeiv_control = c_null_ptr

48.114.1 Member Data Documentation

48.114.1.1 gsl_odeiv_control

```
type(c_ptr) fgsl::fgsl_odeiv_control::gsl_odeiv_control = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.115 fgsl::fgsl_odeiv_control_type Type Reference

Public Attributes

- type(c_ptr) gsl_odeiv_control_type = c_null_ptr

48.115.1 Member Data Documentation

48.115.1.1 gsl_odeiv_control_type

```
type(c_ptr) fgsl::fgsl_odeiv_control_type::gsl_odeiv_control_type = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.116 fgsl::fgsl_odeiv_evolve Type Reference

Public Attributes

- type(c_ptr) gsl_odeiv_evolve

48.116.1 Member Data Documentation

48.116.1.1 gsl_odeiv_evolve

```
type(c_ptr) fgsl::fgsl_odeiv_evolve::gsl_odeiv_evolve
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.117 fgsl::fgsl_odeiv_step Type Reference

Public Attributes

- type(c_ptr) gsl_odeiv_step = c_null_ptr

48.117.1 Member Data Documentation

48.117.1.1 gsl_odeiv_step

```
type(c_ptr) fgsl::fgsl_odeiv_step::gsl_odeiv_step = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.118 fgsl::fgsl_odeiv_step_type Type Reference

Public Attributes

- integer(c_int) which = 0

48.118.1 Member Data Documentation

48.118.1.1 which

```
integer(c_int) fgsl::fgsl_odeiv_step_type::which = 0
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.119 fgsl::fgsl_odeiv_system Type Reference

Public Attributes

- type(c_ptr) gsl_odeiv_system = c_null_ptr

48.119.1 Member Data Documentation

48.119.1.1 gsl_odeiv_system

```
type(c_ptr) fgsl::fgsl_odeiv_system::gsl_odeiv_system = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.120 fgsl::fgsl_permutation Type Reference

Public Attributes

- type(c_ptr) gsl_permutation = c_null_ptr

48.120.1 Member Data Documentation

48.120.1.1 gsl_permutation

```
type(c_ptr) fgsl::fgsl_permutation::gsl_permutation = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.121 fgsl_permute Interface Reference

Public Member Functions

- fgsl_permute
- fgsl_permute_long

48.121.1 Constructor & Destructor Documentation

48.121.1.1 fgsl_permute()

```
fgsl_permute::fgsl_permute
```

48.121.2 Member Function/Subroutine Documentation

48.121.2.1 fgsl_permute_long()

```
fgsl_permute::fgsl_permute_long
```

The documentation for this interface was generated from the following file:

- interface/generics.finc

48.122 fgsl_permute_inverse Interface Reference

Public Member Functions

- fgsl_permute_inverse
- fgsl_permute_long_inverse

48.122.1 Constructor & Destructor Documentation

48.122.1.1 fgsl_permute_inverse()

`fgsl_permute_inverse::fgsl_permute_inverse`

48.122.2 Member Function/Subroutine Documentation

48.122.2.1 fgsl_permute_long_inverse()

`fgsl_permute_inverse::fgsl_permute_long_inverse`

The documentation for this interface was generated from the following file:

- interface/generics.finc

48.123 fgsl::fgsl_poly_complex_workspace Type Reference

Public Attributes

- type(c_ptr) gsl_poly_complex_workspace

48.123.1 Member Data Documentation

48.123.1.1 gsl_poly_complex_workspace

`type(c_ptr) fgsl::fgsl_poly_complex_workspace::gsl_poly_complex_workspace`

The documentation for this type was generated from the following file:

- fgsl.F90

48.124 fgsl::fgsl_qrng Type Reference

Public Attributes

- type(c_ptr) gsl_qrng

48.124.1 Member Data Documentation

48.124.1.1 gsl_qrng

```
type(c_ptr) fgsl::fgsl_qrng::gsl_qrng
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.125 fgsl::fgsl_qrng_type Type Reference

Public Attributes

- integer(fgsl_int) type = 0

48.125.1 Member Data Documentation

48.125.1.1 type

```
integer(fgsl_int) fgsl::fgsl_qrng_type::type = 0
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.126 fgsl::fgsl_ran_discrete_t Type Reference

Public Attributes

- type(c_ptr) gsl_ran_discrete_t

48.126.1 Member Data Documentation

48.126.1.1 gsl_ran_discrete_t

```
type(c_ptr) fgsl::fgsl_ran_discrete_t::gsl_ran_discrete_t
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.127 fgsl_ran_shuffle Interface Reference

Public Member Functions

- fgsl_ran_shuffle
- fgsl_ran_shuffle_double
- fgsl_ran_shuffle_size_t

48.127.1 Constructor & Destructor Documentation

48.127.1.1 fgsl_ran_shuffle()

```
fgsl_ran_shuffle::fgsl_ran_shuffle
```

48.127.2 Member Function/Subroutine Documentation

48.127.2.1 fgsl_ran_shuffle_double()

```
fgsl_ran_shuffle::fgsl_ran_shuffle_double
```

48.127.2.2 fgsl_ran_shuffle_size_t()

```
fgsl_ran_shuffle::fgsl_ran_shuffle_size_t
```

The documentation for this interface was generated from the following file:

- interface/generics.finc

48.128 fgsl::fgsl_rng Type Reference

Public Attributes

- type(c_ptr) gsl_rng = c_null_ptr

48.128.1 Member Data Documentation

48.128.1.1 gsl_rng

```
type(c_ptr) fgsl::fgsl_rng::gsl_rng = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.129 fgsl::fgsl_rng_type Type Reference

Public Attributes

- type(c_ptr) gsl_rng_type = c_null_ptr
- integer(fgsl_int) type = 0

48.129.1 Member Data Documentation

48.129.1.1 gsl_rng_type

```
type(c_ptr) fgsl::fgsl_rng_type::gsl_rng_type = c_null_ptr
```

48.129.1.2 type

```
integer(fgsl_int) fgsl::fgsl_rng_type::type = 0
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.130 fgsl::fgsl_root_fdfsolver Type Reference

Public Attributes

- type(c_ptr) gsl_root_fdfsolver = c_null_ptr

48.130.1 Member Data Documentation

48.130.1.1 gsl_root_fdfsolver

```
type(c_ptr) fgsl::fgsl_root_fdfsolver::gsl_root_fdfsolver = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.131 fgsl::fgsl_root_fdfsolver_type Type Reference

Public Attributes

- integer(c_int) which = 0

48.131.1 Member Data Documentation

48.131.1.1 which

```
integer(c_int) fgsl::fgsl_root_fdfsolver_type::which = 0
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.132 fgsl::fgsl_root_fsolver Type Reference

Public Attributes

- type(c_ptr) gsl_root_fsolver = c_null_ptr

48.132.1 Member Data Documentation

48.132.1.1 gsl_root_fsolver

```
type(c_ptr) fgsl::fgsl_root_fsolver::gsl_root_fsolver = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.133 fgsl::fgsl_root_fsolver_type Type Reference

Public Attributes

- integer(c_int) which = 0

48.133.1 Member Data Documentation

48.133.1.1 which

```
integer(c_int) fgsl::fgsl_root_fsolver_type::which = 0
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.134 fgsl::fgsl_rstat_quantile_workspace Type Reference

Public Attributes

- type(c_ptr) gsl_rstat_quantile_workspace

48.134.1 Member Data Documentation

48.134.1.1 gsl_rstat_quantile_workspace

```
type(c_ptr) fgsl::fgsl_rstat_quantile_workspace::gsl_rstat_quantile_workspace
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.135 fgsl::fgsl_rstat_workspace Type Reference

Public Attributes

- type(c_ptr) gsl_rstat_workspace

48.135.1 Member Data Documentation

48.135.1.1 gsl_rstat_workspace

```
type(c_ptr) fgsl::fgsl_rstat_workspace::gsl_rstat_workspace
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.136 fgsl::fgsl_sf_legendre_t Type Reference

Public Attributes

- integer(c_int) gsl_sf_legendre_t = 0

48.136.1 Member Data Documentation

48.136.1.1 gsl_sf_legendre_t

```
integer(c_int) fgsl::fgsl_sf_legendre_t::gsl_sf_legendre_t = 0
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.137 fgsl::fgsl_sf_mathieu_workspace Type Reference

Public Attributes

- type(c_ptr) gsl_sf_mathieu_workspace

48.137.1 Member Data Documentation

48.137.1.1 gsl_sf_mathieu_workspace

```
type(c_ptr) fgsl::fgsl_sf_mathieu_workspace::gsl_sf_mathieu_workspace
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.138 fgsl::fgsl_sf_result Type Reference

Public Attributes

- real(fgsl_double) val
- real(fgsl_double) err

48.138.1 Member Data Documentation

48.138.1.1 err

```
real(fgsl_double) fgsl::fgsl_sf_result::err
```

48.138.1.2 val

```
real(fgsl_double) fgsl::fgsl_sf_result::val
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.139 fgsl::fgsl_sf_result_e10 Type Reference

Public Attributes

- real(fgsl_double) val
- real(fgsl_double) err
- integer(fgsl_int) e10

48.139.1 Member Data Documentation

48.139.1.1 e10

```
integer(fgsl_int) fgsl::fgsl_sf_result_e10::e10
```

48.139.1.2 err

```
real(fgsl_double) fgsl::fgsl_sf_result_e10::err
```

48.139.1.3 val

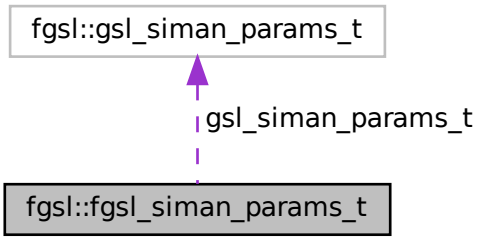
```
real(fgsl_double) fgsl::fgsl_sf_result_e10::val
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.140 fgsl::fgsl_siman_params_t Type Reference

Collaboration diagram for fgsl::fgsl_siman_params_t:



Public Attributes

- type(gsl_siman_params_t), pointer gsl_siman_params_t => null()

48.140.1 Member Data Documentation

48.140.1.1 gsl_siman_params_t

```
type(gsl_siman_params_t), pointer fgsl::fgsl_siman_params_t::gsl_siman_params_t => null()
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.141 fgsl_sizeof Interface Reference

Public Member Functions

- fgsl_sizeof_double
- fgsl_sizeof_float
- fgsl_sizeof_int
- fgsl_sizeof_size_t
- fgsl_sizeof_char
- fgsl_sizeof_vector
- fgsl_sizeof_matrix
- fgsl_sizeof_vector_complex
- fgsl_sizeof_matrix_complex
- fgsl_sizeof_interp
- fgsl_sizeof_permutation
- fgsl_sizeof_combination
- fgsl_sizeof_multiset
- fgsl_sizeof_integration_workspace
- fgsl_sizeof_integration_qaws_table
- fgsl_sizeof_integration_qawo_table
- fgsl_sizeof_wavelet
- fgsl_sizeof_wavelet_workspace

48.141.1 Member Function/Subroutine Documentation

48.141.1.1 fgsl_sizeof_char()

```
fgsl_sizeof::fgsl_sizeof_char
```

48.141.1.2 fgsl_sizeof_combination()

fgsl_sizeof::fgsl_sizeof_combination

48.141.1.3 fgsl_sizeof_double()

fgsl_sizeof::fgsl_sizeof_double

48.141.1.4 fgsl_sizeof_float()

fgsl_sizeof::fgsl_sizeof_float

48.141.1.5 fgsl_sizeof_int()

fgsl_sizeof::fgsl_sizeof_int

48.141.1.6 fgsl_sizeof_integration_qawo_table()

fgsl_sizeof::fgsl_sizeof_integration_qawo_table

48.141.1.7 fgsl_sizeof_integration_qaws_table()

fgsl_sizeof::fgsl_sizeof_integration_qaws_table

48.141.1.8 fgsl_sizeof_integration_workspace()

fgsl_sizeof::fgsl_sizeof_integration_workspace

48.141.1.9 fgsl_sizeof_interp()

fgsl_sizeof::fgsl_sizeof_interp

48.141.1.10 fgsl_sizeof_matrix()

`fgsl_sizeof::fgsl_sizeof_matrix`

48.141.1.11 fgsl_sizeof_matrix_complex()

`fgsl_sizeof::fgsl_sizeof_matrix_complex`

48.141.1.12 fgsl_sizeof_multiset()

`fgsl_sizeof::fgsl_sizeof_multiset`

48.141.1.13 fgsl_sizeof_permutation()

`fgsl_sizeof::fgsl_sizeof_permutation`

48.141.1.14 fgsl_sizeof_size_t()

`fgsl_sizeof::fgsl_sizeof_size_t`

48.141.1.15 fgsl_sizeof_vector()

`fgsl_sizeof::fgsl_sizeof_vector`

48.141.1.16 fgsl_sizeof_vector_complex()

`fgsl_sizeof::fgsl_sizeof_vector_complex`

48.141.1.17 fgsl_sizeof_wavelet()

`fgsl_sizeof::fgsl_sizeof_wavelet`

48.141.1.18 fgsl_sizeof_wavelet_workspace()

```
fgsl_sizeof::fgsl_sizeof_wavelet_workspace
```

The documentation for this interface was generated from the following file:

- interface/generics.finc

48.142 fgsl_sort Interface Reference

Public Member Functions

- fgsl_sort_double
- fgsl_sort_long
- fgsl_sort_vector

48.142.1 Member Function/Subroutine Documentation

48.142.1.1 fgsl_sort_double()

```
fgsl_sort::fgsl_sort_double
```

48.142.1.2 fgsl_sort_long()

```
fgsl_sort::fgsl_sort_long
```

48.142.1.3 fgsl_sort_vector()

```
fgsl_sort::fgsl_sort_vector
```

The documentation for this interface was generated from the following file:

- interface/generics.finc

48.143 fgsl_sort_index Interface Reference

Public Member Functions

- fgsl_sort_double_index
- fgsl_sort_long_index
- fgsl_sort_vector_index

48.143.1 Member Function/Subroutine Documentation

48.143.1.1 fgsl_sort_double_index()

`fgsl_sort_index::fgsl_sort_double_index`

48.143.1.2 fgsl_sort_long_index()

`fgsl_sort_index::fgsl_sort_long_index`

48.143.1.3 fgsl_sort_vector_index()

`fgsl_sort_index::fgsl_sort_vector_index`

The documentation for this interface was generated from the following file:

- interface/generics.finc

48.144 fgsl_sort_largest Interface Reference

Public Member Functions

- fgsl_sort_double_largest
- fgsl_sort_long_largest
- fgsl_sort_vector_largest

48.144.1 Member Function/Subroutine Documentation

48.144.1.1 fgsl_sort_double_largest()

`fgsl_sort_largest::fgsl_sort_double_largest`

48.144.1.2 fgsl_sort_long_largest()

```
fgsl_sort_largest::fgsl_sort_long_largest
```

48.144.1.3 fgsl_sort_vector_largest()

```
fgsl_sort_largest::fgsl_sort_vector_largest
```

The documentation for this interface was generated from the following file:

- interface/generics.finc

48.145 fgsl_sort_largest_index Interface Reference

Public Member Functions

- fgsl_sort_double_largest_index
- fgsl_sort_long_largest_index
- fgsl_sort_vector_largest_index

48.145.1 Member Function/Subroutine Documentation

48.145.1.1 fgsl_sort_double_largest_index()

```
fgsl_sort_largest_index::fgsl_sort_double_largest_index
```

48.145.1.2 fgsl_sort_long_largest_index()

```
fgsl_sort_largest_index::fgsl_sort_long_largest_index
```

48.145.1.3 fgsl_sort_vector_largest_index()

```
fgsl_sort_largest_index::fgsl_sort_vector_largest_index
```

The documentation for this interface was generated from the following file:

- interface/generics.finc

48.146 fgsl_sort_smallest Interface Reference

Public Member Functions

- fgsl_sort_double_smallest
- fgsl_sort_long_smallest
- fgsl_sort_vector_smallest

48.146.1 Member Function/Subroutine Documentation

48.146.1.1 fgsl_sort_double_smallest()

```
fgsl_sort_smallest::fgsl_sort_double_smallest
```

48.146.1.2 fgsl_sort_long_smallest()

```
fgsl_sort_smallest::fgsl_sort_long_smallest
```

48.146.1.3 fgsl_sort_vector_smallest()

```
fgsl_sort_smallest::fgsl_sort_vector_smallest
```

The documentation for this interface was generated from the following file:

- interface/generics.finc

48.147 fgsl_sort_smallest_index Interface Reference

Public Member Functions

- fgsl_sort_double_smallest_index
- fgsl_sort_long_smallest_index
- fgsl_sort_vector_smallest_index

48.147.1 Member Function/Subroutine Documentation

48.147.1.1 fgsl_sort_double_smallest_index()

```
fgsl_sort_smallest_index::fgsl_sort_double_smallest_index
```

48.147.1.2 fgsl_sort_long_smallest_index()

```
fgsl_sort_smallest_index::fgsl_sort_long_smallest_index
```

48.147.1.3 fgsl_sort_vector_smallest_index()

```
fgsl_sort_smallest_index::fgsl_sort_vector_smallest_index
```

The documentation for this interface was generated from the following file:

- interface/generics.finc

48.148 fgsl::fgsl_splinalg_itersolve Type Reference

Public Attributes

- type(c_ptr) gsl_splinalg_itersolve

48.148.1 Member Data Documentation

48.148.1.1 gsl_splinalg_itersolve

```
type(c_ptr) fgsl::fgsl_splinalg_itersolve::gsl_splinalg_itersolve
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.149 fgsl::fgsl_splinalg_itersolve_type Type Reference

Public Attributes

- integer(c_int) which = 0

48.149.1 Member Data Documentation

48.149.1.1 which

```
integer(c_int) fgsl::fgsl_splinalg_itersolve_type::which = 0
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.150 fgsl::fgsl_spline Type Reference

Public Attributes

- type(c_ptr) gsl_spline = c_null_ptr

48.150.1 Member Data Documentation

48.150.1.1 gsl_spline

```
type(c_ptr) fgsl::fgsl_spline::gsl_spline = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.151 fgsl::fgsl_spline2d Type Reference

Public Attributes

- type(c_ptr) gsl_spline2d = c_null_ptr

48.151.1 Member Data Documentation

48.151.1.1 gsl_spline2d

```
type(c_ptr) fgsl::fgsl_spline2d::gsl_spline2d = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.152 fgsl::fgsl_spmatrix Type Reference

Public Attributes

- type(c_ptr) gsl_spmatrix = c_null_ptr

48.152.1 Member Data Documentation

48.152.1.1 gsl_spmatrix

```
type(c_ptr) fgsl::fgsl_spmatrix::gsl_spmatrix = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.153 fgsl::fgsl_sum_levin_u_workspace Type Reference

Public Attributes

- type(c_ptr) gsl_sum_levin_u_workspace = c_null_ptr

48.153.1 Member Data Documentation

48.153.1.1 gsl_sum_levin_u_workspace

```
type(c_ptr) fgsl::fgsl_sum_levin_u_workspace::gsl_sum_levin_u_workspace = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.154 fgsl::fgsl_sum_levin_utrunc_workspace Type Reference

Public Attributes

- type(c_ptr) gsl_sum_levin_utrunc_workspace = c_null_ptr

48.154.1 Member Data Documentation

48.154.1.1 gsl_sum_levin_utrunc_workspace

```
type(c_ptr) fgsl::fgsl_sum_levin_utrunc_workspace::gsl_sum_levin_utrunc_workspace = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.155 fgsl::fgsl_vector Type Reference

Public Attributes

- type(c_ptr) gsl_vector = c_null_ptr

48.155.1 Member Data Documentation

48.155.1.1 gsl_vector

```
type(c_ptr) fgsl::fgsl_vector::gsl_vector = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.156 fgsl_vector_align Interface Reference

Public Member Functions

- fgsl_vector_align
- fgsl_vector_complex_align
- fgsl_vector_pointer_align
- fgsl_vector_complex_pointer_align

48.156.1 Constructor & Destructor Documentation

48.156.1.1 fgsl_vector_align()

`fgsl_vector_align::fgsl_vector_align`

48.156.2 Member Function/Subroutine Documentation

48.156.2.1 fgsl_vector_complex_align()

`fgsl_vector_align::fgsl_vector_complex_align`

48.156.2.2 fgsl_vector_complex_pointer_align()

`fgsl_vector_align::fgsl_vector_complex_pointer_align`

48.156.2.3 fgsl_vector_pointer_align()

`fgsl_vector_align::fgsl_vector_pointer_align`

The documentation for this interface was generated from the following file:

- interface/generics.finc

48.157 fgsl::fgsl_vector_complex Type Reference

Public Attributes

- type(c_ptr) gsl_vector_complex = c_null_ptr

48.157.1 Member Data Documentation

48.157.1.1 gsl_vector_complex

```
type(c_ptr) fgsl::fgsl_vector_complex::gsl_vector_complex = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.158 fgsl_vector_free Interface Reference

Public Member Functions

- fgsl_vector_free
- fgsl_vector_int_free
- fgsl_vector_complex_free

48.158.1 Constructor & Destructor Documentation

48.158.1.1 fgsl_vector_free()

```
fgsl_vector_free::fgsl_vector_free
```

48.158.2 Member Function/Subroutine Documentation

48.158.2.1 fgsl_vector_complex_free()

```
fgsl_vector_free::fgsl_vector_complex_free
```

48.158.2.2 fgsl_vector_int_free()

```
fgsl_vector_free::fgsl_vector_int_free
```

The documentation for this interface was generated from the following file:

- interface/generics.finc

48.159 fgsl_vector_init Interface Reference

Public Member Functions

- fgsl_vector_init
- fgsl_vector_int_init
- fgsl_vector_init_legacy
- fgsl_vector_complex_init

48.159.1 Constructor & Destructor Documentation

48.159.1.1 fgsl_vector_init()

`fgsl_vector_init::fgsl_vector_init`

48.159.2 Member Function/Subroutine Documentation

48.159.2.1 fgsl_vector_complex_init()

`fgsl_vector_init::fgsl_vector_complex_init`

48.159.2.2 fgsl_vector_init_legacy()

`fgsl_vector_init::fgsl_vector_init_legacy`

48.159.2.3 fgsl_vector_int_init()

`fgsl_vector_init::fgsl_vector_int_init`

The documentation for this interface was generated from the following file:

- interface/generics.finc

48.160 fgsl::fgsl_vector_int Type Reference

Public Attributes

- type(c_ptr) gsl_vector_int = c_null_ptr

48.160.1 Member Data Documentation

48.160.1.1 gsl_vector_int

```
type(c_ptr) fgsl::fgsl_vector_int::gsl_vector_int = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.161 fgsl_vector_to_fptr Interface Reference

Public Member Functions

- fgsl_vector_to_fptr
- fgsl_vector_int_to_fptr

48.161.1 Constructor & Destructor Documentation

48.161.1.1 fgsl_vector_to_fptr()

```
fgsl_vector_to_fptr::fgsl_vector_to_fptr
```

48.161.2 Member Function/Subroutine Documentation

48.161.2.1 fgsl_vector_int_to_fptr()

```
fgsl_vector_to_fptr::fgsl_vector_int_to_fptr
```

The documentation for this interface was generated from the following file:

- interface/generics.finc

48.162 fgsl::fgsl_wavelet Type Reference

Public Attributes

- type(c_ptr) gsl_wavelet = c_null_ptr

48.162.1 Member Data Documentation

48.162.1.1 gsl_wavelet

```
type(c_ptr) fgsl::fgsl_wavelet::gsl_wavelet = c_null_ptr
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.163 fgsl::fgsl_wavelet_type Type Reference

Public Attributes

- integer(c_int) which = 0

48.163.1 Member Data Documentation

48.163.1.1 which

```
integer(c_int) fgsl::fgsl_wavelet_type::which = 0
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.164 fgsl::fgsl_wavelet_workspace Type Reference

Public Attributes

- type(c_ptr) gsl_wavelet_workspace

48.164.1 Member Data Documentation

48.164.1.1 gsl_wavelet_workspace

```
type(c_ptr) fgsl::fgsl_wavelet_workspace::gsl_wavelet_workspace
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.165 fgsl_well_defined Interface Reference

Public Member Functions

- fgsl_vector_status
- fgsl_vector_int_status
- fgsl_matrix_status
- fgsl_vector_complex_status
- fgsl_matrix_complex_status
- fgsl_cheb_series_status
- fgsl_interp_status
- fgsl_interp2d_status
- fgsl_dht_status
- fgsl_error_handler_status
- fgsl_integration_workspace_status
- fgsl_integration_cquad_workspace_status
- fgsl_integration_qawo_table_status
- fgsl_integration_qaws_table_status
- fgsl_integration_glfixed_table_status
- fgsl_interp_accel_status
- fgsl_spline_status
- fgsl_spline2d_status
- fgsl_permutation_status
- fgsl_combination_status
- fgsl_multiset_status
- fgsl_odeiv_control_status
- fgsl_odeiv_evolve_status
- fgsl_odeiv_step_status
- fgsl_odeiv_system_status
- fgsl_odeiv2_control_status
- fgsl_odeiv2_evolve_status
- fgsl_odeiv2_step_status
- fgsl_odeiv2_system_status
- fgsl_odeiv2_driver_status
- fgsl_poly_complex_workspace_stat
- fgsl_rng_status
- fgsl_qrng_status
- fgsl_ran_discrete_t_status

- fgsl_root_fsolver_status
- fgsl_root_fdfsolver_status
- fgsl_siman_params_t_status
- fgsl_min_fminimizer_status
- fgsl_histogram_status
- fgsl_ntuple_status
- fgsl_ntuple_value_fn_status
- fgsl_ntuple_select_fn_status
- fgsl_monte_function_status
- fgsl_monte_plain_status
- fgsl_monte_miser_status
- fgsl_monte_vegas_status
- fgsl_multiroot_fsolver_status
- fgsl_multiroot_fdfsolver_status
- fgsl_multimin_fminimizer_status
- fgsl_multimin_fdfminimizer_status
- fgsl_multifit_status
- fgsl_multifit_fsolver_status
- fgsl_multifit_fdfsolver_status
- fgsl_multifit_nlinear_status
- fgsl_file_status
- fgsl_wavelet_status
- fgsl_wavelet_workspace_status

48.165.1 Member Function/Subroutine Documentation

48.165.1.1 fgsl_cheb_series_status()

```
fgsl_well_defined::fgsl_cheb_series_status
```

48.165.1.2 fgsl_combination_status()

```
fgsl_well_defined::fgsl_combination_status
```

48.165.1.3 fgsl_dht_status()

```
fgsl_well_defined::fgsl_dht_status
```

48.165.1.4 fgsl_error_handler_status()

```
fgsl_well_defined::fgsl_error_handler_status
```

48.165.1.5 fgsl_file_status()

```
fgsl_well_defined::fgsl_file_status
```

48.165.1.6 fgsl_histogram_status()

```
fgsl_well_defined::fgsl_histogram_status
```

48.165.1.7 fgsl_integration_cquad_workspace_status()

```
fgsl_well_defined::fgsl_integration_cquad_workspace_status
```

48.165.1.8 fgsl_integration_glfixed_table_status()

```
fgsl_well_defined::fgsl_integration_glfixed_table_status
```

48.165.1.9 fgsl_integration_qawo_table_status()

```
fgsl_well_defined::fgsl_integration_qawo_table_status
```

48.165.1.10 fgsl_integration_qaws_table_status()

```
fgsl_well_defined::fgsl_integration_qaws_table_status
```

48.165.1.11 fgsl_integration_workspace_status()

```
fgsl_well_defined::fgsl_integration_workspace_status
```

48.165.1.12 fgsl_interp2d_status()

```
fgsl_well_defined::fgsl_interp2d_status
```

48.165.1.13 fgsl_interp_accel_status()

```
fgsl_well_defined::fgsl_interp_accel_status
```

48.165.1.14 fgsl_interp_status()

```
fgsl_well_defined::fgsl_interp_status
```

48.165.1.15 fgsl_matrix_complex_status()

```
fgsl_well_defined::fgsl_matrix_complex_status
```

48.165.1.16 fgsl_matrix_status()

```
fgsl_well_defined::fgsl_matrix_status
```

48.165.1.17 fgsl_min_fminimizer_status()

```
fgsl_well_defined::fgsl_min_fminimizer_status
```

48.165.1.18 fgsl_monte_function_status()

```
fgsl_well_defined::fgsl_monte_function_status
```

48.165.1.19 fgsl_monte_miser_status()

```
fgsl_well_defined::fgsl_monte_miser_status
```

48.165.1.20 fgsl_monte_plain_status()

```
fgsl_well_defined::fgsl_monte_plain_status
```

48.165.1.21 fgsl_monte_vegas_status()

```
fgsl_well_defined::fgsl_monte_vegas_status
```

48.165.1.22 fgsl_multifit_fdfsolver_status()

```
fgsl_well_defined::fgsl_multifit_fdfsolver_status
```

48.165.1.23 fgsl_multifit_fsolver_status()

```
fgsl_well_defined::fgsl_multifit_fsolver_status
```

48.165.1.24 fgsl_multifit_nlinear_status()

```
fgsl_well_defined::fgsl_multifit_nlinear_status
```

48.165.1.25 fgsl_multifit_status()

```
fgsl_well_defined::fgsl_multifit_status
```

48.165.1.26 fgsl_multimin_fdfminimizer_status()

```
fgsl_well_defined::fgsl_multimin_fdfminimizer_status
```

48.165.1.27 fgsl_multimin_fminimizer_status()

```
fgsl_well_defined::fgsl_multimin_fminimizer_status
```

48.165.1.28 fgsl_multiroot_fdfsolver_status()

```
fgsl_well_defined::fgsl_multiroot_fdfsolver_status
```

48.165.1.29 fgsl_multiroot_fsolver_status()

```
fgsl_well_defined::fgsl_multiroot_fsolver_status
```

48.165.1.30 fgsl_multiset_status()

```
fgsl_well_defined::fgsl_multiset_status
```

48.165.1.31 fgsl_ntuple_select_fn_status()

```
fgsl_well_defined::fgsl_ntuple_select_fn_status
```

48.165.1.32 fgsl_ntuple_status()

```
fgsl_well_defined::fgsl_ntuple_status
```

48.165.1.33 fgsl_ntuple_value_fn_status()

```
fgsl_well_defined::fgsl_ntuple_value_fn_status
```

48.165.1.34 fgsl_odeiv2_control_status()

```
fgsl_well_defined::fgsl_odeiv2_control_status
```

48.165.1.35 fgsl_odeiv2_driver_status()

```
fgsl_well_defined::fgsl_odeiv2_driver_status
```

48.165.1.36 fgsl_odeiv2_evolve_status()

```
fgsl_well_defined::fgsl_odeiv2_evolve_status
```

48.165.1.37 fgsl_odeiv2_step_status()

```
fgsl_well_defined::fgsl_odeiv2_step_status
```

48.165.1.38 fgsl_odeiv2_system_status()

```
fgsl_well_defined::fgsl_odeiv2_system_status
```

48.165.1.39 fgsl_odeiv_control_status()

```
fgsl_well_defined::fgsl_odeiv_control_status
```

48.165.1.40 fgsl_odeiv_evolve_status()

```
fgsl_well_defined::fgsl_odeiv_evolve_status
```

48.165.1.41 fgsl_odeiv_step_status()

```
fgsl_well_defined::fgsl_odeiv_step_status
```

48.165.1.42 fgsl_odeiv_system_status()

```
fgsl_well_defined::fgsl_odeiv_system_status
```

48.165.1.43 fgsl_permutation_status()

```
fgsl_well_defined::fgsl_permutation_status
```

48.165.1.44 fgsl_poly_complex_workspace_stat()

```
fgsl_well_defined::fgsl_poly_complex_workspace_stat
```

48.165.1.45 fgsl_qrng_status()

```
fgsl_well_defined::fgsl_qrng_status
```

48.165.1.46 fgsl_ran_discrete_t_status()

```
fgsl_well_defined::fgsl_ran_discrete_t_status
```

48.165.1.47 fgsl_rng_status()

```
fgsl_well_defined::fgsl_rng_status
```

48.165.1.48 fgsl_root_fdfsolver_status()

```
fgsl_well_defined::fgsl_root_fdfsolver_status
```

48.165.1.49 fgsl_root_fsolver_status()

```
fgsl_well_defined::fgsl_root_fsolver_status
```

48.165.1.50 fgsl_siman_params_t_status()

```
fgsl_well_defined::fgsl_siman_params_t_status
```

48.165.1.51 fgsl_spline2d_status()

```
fgsl_well_defined::fgsl_spline2d_status
```

48.165.1.52 fgsl_spline_status()

```
fgsl_well_defined::fgsl_spline_status
```

48.165.1.53 fgsl_vector_complex_status()

```
fgsl_well_defined::fgsl_vector_complex_status
```

48.165.1.54 fgsl_vector_int_status()

```
fgsl_well_defined::fgsl_vector_int_status
```

48.165.1.55 fgsl_vector_status()

```
fgsl_well_defined::fgsl_vector_status
```

48.165.1.56 fgsl_wavelet_status()

```
fgsl_well_defined::fgsl_wavelet_status
```

48.165.1.57 fgsl_wavelet_workspace_status()

```
fgsl_well_defined::fgsl_wavelet_workspace_status
```

The documentation for this interface was generated from the following file:

- interface/generics.finc

48.166 fgsl::gsl_complex Type Reference

Public Attributes

- real(c_double), dimension(2) dat

48.166.1 Member Data Documentation

48.166.1.1 dat

```
real(c_double), dimension(2) fgsl::gsl_complex::dat
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.167 fgsl::gsl_sf_result Type Reference

Public Attributes

- real(c_double) val
- real(c_double) err

48.167.1 Member Data Documentation

48.167.1.1 err

```
real(c_double) fgsl::gsl_sf_result::err
```

48.167.1.2 val

```
real(c_double) fgsl::gsl_sf_result::val
```

The documentation for this type was generated from the following file:

- fgsl.F90

48.168 fgsl::gsl_sf_result_e10 Type Reference

Public Attributes

- real(c_double) val
- real(c_double) err
- integer(c_int) e10

48.168.1 Member Data Documentation

48.168.1.1 e10

```
integer(c_int) fgsl::gsl_sf_result_e10::e10
```

48.168.1.2 err

```
real(c_double) fgsl::gsl_sf_result_e10::err
```

48.168.1.3 val

```
real(c_double) fgsl::gsl_sf_result_e10::val
```

The documentation for this type was generated from the following file:

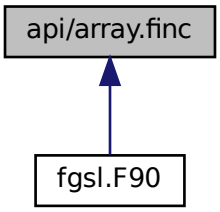
- fgsl.F90

Chapter 49

File Documentation

49.1 api/array.finc File Reference

This graph shows which files directly or indirectly include this file:



Functions/Subroutines

- type(fgsl_vector) function fgsl_vector_init (array, stride, stat)

  Initialize a GSL vector object. This is invoked via the generic fgsl_vector_init.
- type(fgsl_vector_int) function fgsl_vector_int_init (array, stride, stat)
- type(fgsl_vector) function fgsl_vector_init_legacy (type)

  Legacy specific fgsl_vector_init of for GSL vector initialization.
- integer(fgsl_int) function fgsl_vector_align (array, len, fvec, size, offset, stride)

  Legacy function to wrap a rank 1 Fortran array slice inside a double precision real GSL vector object. This is invoked via the generic fgsl_vector_align. It is recommended to update codes using this to use the new fgsl_vector_init specific instead.
- real(fgsl_double) function, dimension(:), pointer fgsl_vector_to_fptr (fvec)

  Function to associate a Fortran pointer with a GSL vector object.
- integer(fgsl_int) function, dimension(:), pointer fgsl_vector_int_to_fptr (fvec)
- integer(fgsl_int) function fgsl_vector_pointer_align (ptr, fvec)

Legacy function to associate a Fortran pointer with the data stored inside a GSL vector object. Codes should be updated to use fgsl_vector_ptr. This is invoked via the generic fgsl_vector_align. Objects of type `gsl_vector` which are returned by GSL routines often are persistent subobjects of other GSL objects. A Fortran pointer aligned with a subobject hence will remain up-to-date throughout the lifetime of the object; it may become undefined once the object ceases to exist.

- subroutine fgsl_vector_to_array (result, source)

  The assignment operator (see interface/generics.finc) is overloaded to enable copying of the content of a GSL vector into a Fortran array.
- subroutine fgsl_vector_free (fvec)

  Free the resources inside a GSL vector object previously established by a call to fgsl_vector_init(). This is invoked via the generic fgsl_vector_free.
- subroutine fgsl_vector_int_free (fvec)
- subroutine fgsl_vector_c_ptr (res, src)
- logical function fgsl_vector_status (vector)
- logical function fgsl_vector_int_status (vector)

  Inquire the size of a double precision real GSL vector object.
- integer(fgsl_size_t) function fgsl_sizeof_vector (w)
- type(fgsl_vector_complex) function fgsl_vector_complex_init (type)

  Initialize a complex GSL vector object. This is invoked via the generic fgsl_vector_init.
- integer(fgsl_int) function fgsl_vector_complex_align (array, len, fvec, size, offset, stride)

  Wrap a rank 1 Fortran array slice inside a double precision complex real GSL vector object. This is invoked via the generic fgsl_vector_align.
- integer(fgsl_int) function fgsl_vector_complex_pointer_align (ptr, fvec)

  Associate a Fortran pointer with the data stored inside a GSL vector object. This is invoked via the generic fgsl_vector_align. Objects of type `gsl_vector_complex` which are returned by GSL routines often are persistent subobjects of other GSL objects. A Fortran pointer aligned with a subobject hence will remain up-to-date throughout the lifetime of the object; it may become undefined once the object ceases to exist.
- subroutine fgsl_vector_complex_to_array (result, source)

  The assignment operator (see interface/generics.finc) is overloaded to enable copying of the content of a complex GSL vector into a Fortran array.
- subroutine fgsl_vector_complex_free (fvec)

  Free the resources inside a complex GSL vector object previously established by a call to fgsl_vector_complex_init(). This is invoked via the generic fgsl_vector_free.
- subroutine fgsl_vector_complex_c_ptr (res, src)
- logical function fgsl_vector_complex_status (vector_complex)
- integer(fgsl_size_t) function fgsl_sizeof_vector_complex (w)

  Inquire the size of a double precision complex GSL vector object.
- type(fgsl_matrix) function fgsl_matrix_init (type)

  Initialize a GSL matrix object. This is invoked via the generic fgsl_matrix_init.
- integer(fgsl_int) function fgsl_matrix_align (array, lda, n, m, fmat)

  Wrap a rank 2 Fortran array inside a double precision real GSL matrix object. This is invoked via the generic fgsl_matrix_align.
- integer(fgsl_int) function fgsl_matrix_pointer_align (ptr, fmat)

  Associate a Fortran pointer with the data stored inside a GSL matrix object. This is invoked via the generic fgsl_matrix_align. Objects of type `gsl_matrix` which are returned by GSL routines often are persistent subobjects of other GSL objects. A Fortran pointer aligned with a subobject hence will remain up-to-date throughout the lifetime of the object; it may become undefined once the object ceases to exist.
- subroutine fgsl_matrix_to_array (result, source)

  The assignment operator (see interface/generics.finc) is overloaded to enable copying of the content of a GSL matrix into a rank 2 Fortran array.
- subroutine fgsl_matrix_free (fvec)

  Free the resources inside a GSL matrix object previously established by a call to fgsl_matrix_init(). This is invoked via the generic fgsl_matrix_free.
- subroutine fgsl_matrix_c_ptr (res, src)
- logical function fgsl_matrix_status (matrix)

- integer(fgsl_size_t) function fgsl_sizeof_matrix (w)

  Inquire the number of elements in a double precision real GSL matrix object.
- type(fgsl_matrix_complex) function fgsl_matrix_complex_init (type)

  Initialize a GSL matrix object. This is invoked via the generic fgsl_matrix_init.
- integer(fgsl_int) function fgsl_matrix_complex_align (array, lda, n, m, fmat)

  Wrap a rank 2 Fortran array inside a double precision complex GSL matrix object. This is invoked via the generic fgsl_matrix_align.
- integer(fgsl_int) function fgsl_matrix_complex_pointer_align (ptr, fmat)

  Associate a Fortran pointer with the data stored inside a complex GSL matrix object. This is invoked via the generic fgsl_matrix_align. Objects of type `gsl_matrix_complex` which are returned by GSL routines often are persistent subobjects of other GSL objects. A Fortran pointer aligned with a subobject hence will remain up-to-date throughout the lifetime of the object; it may become undefined once the object ceases to exist.
- subroutine fgsl_matrix_complex_to_array (result, source)

  The assignment operator (see interface/generics.finc) is overloaded to enable copying of the content of a complex GSL matrix into a rank 2 Fortran array.
- subroutine fgsl_matrix_complex_free (fvec)

  Free the resources inside a complex GSL matrix object previously established by a call to fgsl_matrix_complex_init(). This is invoked via the generic fgsl_matrix_free.
- subroutine fgsl_matrix_complex_c_ptr (res, src)
- logical function fgsl_matrix_complex_status (matrix_complex)
- integer(fgsl_size_t) function fgsl_sizeof_matrix_complex (w)

  Inquire the number of elements in a double precision complex GSL matrix object.
- integer(fgsl_size_t) function fgsl_vector_get_size (vec)
- integer(fgsl_size_t) function fgsl_vector_get_stride (vec)
- integer(fgsl_size_t) function fgsl_matrix_get_size1 (matr)
- integer(fgsl_size_t) function fgsl_matrix_get_size2 (matr)
- integer(fgsl_size_t) function fgsl_matrix_get_tda (matr)

49.1.1 Function/Subroutine Documentation

49.1.1.1 fgsl_matrix_align()

```
integer(fgsl_int) function fgsl_matrix_align (
             real(fgsl_double), dimension(lda, m), intent(in), target array,
             integer(fgsl_size_t), intent(in) lda,
             integer(fgsl_size_t), intent(in) n,
             integer(fgsl_size_t), intent(in) m,
             type(fgsl_matrix), intent(inout) fmat )
```

Wrap a rank 2 Fortran array inside a double precision real GSL matrix object. This is invoked via the generic fgsl_matrix_align.

Parameters

array	- requires the actual argument to have the TARGET attribute. Otherwise being passed by reference is not guaranteed by the Fortran standard.
lda	- leading dimension of the rank 2 array
n	- number of rows in array
m	- number of columns in array
fmat	- previously initialized double precision GSL matrix object

Returns

Status

49.1.1.2 fgsl_matrix_c_ptr()

```
subroutine fgsl_matrix_c_ptr (
             type(fgsl_matrix), intent(out) res,
             type(c_ptr), intent(in) src )
```

49.1.1.3 fgsl_matrix_complex_align()

```
integer(fgsl_int) function fgsl_matrix_complex_align (
             complex(fgsl_double_complex), dimension(lda, m), intent(in), target array,
             integer(fgsl_size_t), intent(in) lda,
             integer(fgsl_size_t), intent(in) n,
             integer(fgsl_size_t), intent(in) m,
             type(fgsl_matrix_complex), intent(inout) fmat )
```

Wrap a rank 2 Fortran array inside a double precision complex GSL matrix object. This is invoked via the generic fgsl_matrix_align.

Parameters

array	- requires the actual argument to have the TARGET attribute. Otherwise being passed by reference is not guaranteed by the Fortran standard.
lda	- leading dimension of the rank 2 array
n	- number of rows in array
m	- number of columns in array
fmat	- previously initialized double precision complex GSL matrix object

Returns

Status

49.1.1.4 fgsl_matrix_complex_c_ptr()

```
subroutine fgsl_matrix_complex_c_ptr (
             type(fgsl_matrix_complex), intent(out) res,
             type(c_ptr), intent(in) src )
```

49.1.1.5 fgsl_matrix_complex_free()

```
subroutine fgsl_matrix_complex_free (
             type(fgsl_matrix_complex), intent(inout) fvec )
```

Free the resources inside a complex GSL matrix object previously established by a call to fgsl_matrix_complex_init(). This is invoked via the generic fgsl_matrix_free.

49.1.1.6 fgsl_matrix_complex_init()

```
type(fgsl_matrix_complex) function fgsl_matrix_complex_init (
             complex(fgsl_double_complex), intent(in) type )
```

Initialize a GSL matrix object. This is invoked via the generic fgsl_matrix_init.

Parameters

type	- determine intrinsic type of vector object

Returns

new object of type fgsl_matrix.

49.1.1.7 fgsl_matrix_complex_pointer_align()

```
integer(fgsl_int) function fgsl_matrix_complex_pointer_align (
             complex(fgsl_double_complex), dimension(:,:), intent(out), pointer ptr,
             type(fgsl_matrix_complex), intent(in) fmat )
```

Associate a Fortran pointer with the data stored inside a complex GSL matrix object. This is invoked via the generic fgsl_matrix_align. Objects of type `gsl_matrix_complex` which are returned by GSL routines often are persistent subobjects of other GSL objects. A Fortran pointer aligned with a subobject hence will remain up-to-date throughout the lifetime of the object; it may become undefined once the object ceases to exist.

Parameters

ptr	- rank 2 Fortran pointer
fmat	- double precision complex GSL matrix

Returns

Status

49.1.1.8 fgsl_matrix_complex_status()

```
logical function fgsl_matrix_complex_status (
            type(fgsl_matrix_complex), intent(in) matrix_complex )
```

49.1.1.9 fgsl_matrix_complex_to_array()

```
subroutine fgsl_matrix_complex_to_array (
            complex(fgsl_double_complex), dimension(:,:), intent(inout) result,
            type(fgsl_matrix_complex), intent(in) source )
```

The assignment operator (see interface/generics.finc) is overloaded to enable copying of the content of a complex GSL matrix into a rank 2 Fortran array.

49.1.1.10 fgsl_matrix_free()

```
subroutine fgsl_matrix_free (
            type(fgsl_matrix), intent(inout) fvec )
```

Free the resources inside a GSL matrix object previously established by a call to fgsl_matrix_init(). This is invoked via the generic fgsl_matrix_free.

49.1.1.11 fgsl_matrix_get_size1()

```
integer(fgsl_size_t) function fgsl_matrix_get_size1 (
            type(fgsl_matrix), intent(in) matr )
```

49.1.1.12 fgsl_matrix_get_size2()

```
integer(fgsl_size_t) function fgsl_matrix_get_size2 (
            type(fgsl_matrix), intent(in) matr )
```

49.1.1.13 fgsl_matrix_get_tda()

```
integer(fgsl_size_t) function fgsl_matrix_get_tda (
            type(fgsl_matrix), intent(in) matr )
```

49.1.1.14 fgsl_matrix_init()

```
type(fgsl_matrix) function fgsl_matrix_init (
            real(fgsl_double), intent(in) type )
```

Initialize a GSL matrix object. This is invoked via the generic fgsl_matrix_init.

Parameters

type	- determine intrinsic type of vector object

Returns

new object of type fgsl_matrix.

49.1.1.15 fgsl_matrix_pointer_align()

```
integer(fgsl_int) function fgsl_matrix_pointer_align (
             real(fgsl_double), dimension(:,:), intent(out), pointer ptr,
             type(fgsl_matrix), intent(in) fmat )
```

Associate a Fortran pointer with the data stored inside a GSL matrix object. This is invoked via the generic fgsl_matrix_align. Objects of type `gsl_matrix` which are returned by GSL routines often are persistent sub-objects of other GSL objects. A Fortran pointer aligned with a subobject hence will remain up-to-date throughout the lifetime of the object; it may become undefined once the object ceases to exist.

Parameters

ptr	- rank 2 Fortran pointer
fmat	- double precision real GSL matrix

Returns

Status

49.1.1.16 fgsl_matrix_status()

```
logical function fgsl_matrix_status (
             type(fgsl_matrix), intent(in) matrix )
```

49.1.1.17 fgsl_matrix_to_array()

```
subroutine fgsl_matrix_to_array (
             real(fgsl_double), dimension(:,:), intent(inout) result,
             type(fgsl_matrix), intent(in) source )
```

The assignment operator (see interface/generics.finc) is overloaded to enable copying of the content of a GSL matrix into a rank 2 Fortran array.

49.1.1.18 fgsl_sizeof_matrix()

```
integer(fgsl_size_t) function fgsl_sizeof_matrix (
             type(fgsl_matrix), intent(in) w )
```

Inquire the number of elements in a double precision real GSL matrix object.

49.1.1.19 fgsl_sizeof_matrix_complex()

```
integer(fgsl_size_t) function fgsl_sizeof_matrix_complex (
             type(fgsl_matrix_complex), intent(in) w )
```

Inquire the number of elements in a double precision complex GSL matrix object.

49.1.1.20 fgsl_sizeof_vector()

```
integer(fgsl_size_t) function fgsl_sizeof_vector (
             type(fgsl_vector), intent(in) w )
```

49.1.1.21 fgsl_sizeof_vector_complex()

```
integer(fgsl_size_t) function fgsl_sizeof_vector_complex (
             type(fgsl_vector_complex), intent(in) w )
```

Inquire the size of a double precision complex GSL vector object.

49.1.1.22 fgsl_vector_align()

```
integer(fgsl_int) function fgsl_vector_align (
             real(fgsl_double), dimension(len), intent(in), target array,
             integer(fgsl_size_t), intent(in) len,
             type(fgsl_vector), intent(inout) fvec,
             integer(fgsl_size_t), intent(in) size,
             integer(fgsl_size_t), intent(in) offset,
             integer(fgsl_size_t), intent(in) stride )
```

Legacy function to wrap a rank 1 Fortran array slice inside a double precision real GSL vector object. This is invoked via the generic fgsl_vector_align. It is recommended to update codes using this to use the new fgsl_vector_init specific instead.

Parameters

array	- requires the actual argument to have the TARGET attribute. Otherwise being passed by reference is not guaranteed by the Fortran standard.
len	- number of elements of the rank 1 array
fvec	- previously initialized GSL vector object
size	- number of elements from array wrapped inside fvec
offset	- index of first element of array to be mapped to fvec
stride	- stride in array for successive elements of fvec

Returns

Status

49.1.1.23 fgsl_vector_c_ptr()

```
subroutine fgsl_vector_c_ptr (
             type(fgsl_vector), intent(out) res,
             type(c_ptr), intent(in) src )
```

49.1.1.24 fgsl_vector_complex_align()

```
integer(fgsl_int) function fgsl_vector_complex_align (
             complex(fgsl_double_complex), dimension(len), intent(in), target array,
             integer(fgsl_size_t), intent(in) len,
             type(fgsl_vector_complex), intent(inout) fvec,
             integer(fgsl_size_t), intent(in) size,
             integer(fgsl_size_t), intent(in) offset,
             integer(fgsl_size_t), intent(in) stride )
```

Wrap a rank 1 Fortran array slice inside a double precision complex real GSL vector object. This is invoked via the generic fgsl_vector_align.

Parameters

array	- requires the actual argument to have the TARGET attribute. Otherwise being passed by reference is not guaranteed by the Fortran standard.
len	- number of elements of the rank 1 array
fvec	- previously initialized complex GSL vector object
size	- number of elements from array wrapped inside fvec
offset	- index of first element of array to be mapped to fvec
stride	- stride in array for successive elements of fvec

Returns

Status

49.1.1.25 fgsl_vector_complex_c_ptr()

```
subroutine fgsl_vector_complex_c_ptr (
             type(fgsl_vector_complex), intent(out) res,
             type(c_ptr), intent(in) src )
```

49.1.1.26 fgsl_vector_complex_free()

```
subroutine fgsl_vector_complex_free (
             type(fgsl_vector_complex), intent(inout) fvec )
```

Free the resources inside a complex GSL vector object previously established by a call to fgsl_vector_complex_init(). This is invoked via the generic fgsl_vector_free.

49.1.1.27 fgsl_vector_complex_init()

```
type(fgsl_vector_complex) function fgsl_vector_complex_init (
             complex(fgsl_double_complex), intent(in) type )
```

Initialize a complex GSL vector object. This is invoked via the generic fgsl_vector_init.

Parameters

type	- determine intrinsic type of vector object

Returns

new object of type fgsl_vector

49.1.1.28 fgsl_vector_complex_pointer_align()

```
integer(fgsl_int) function fgsl_vector_complex_pointer_align (
             complex(fgsl_double_complex), dimension(:), intent(out), pointer ptr,
             type(fgsl_vector_complex), intent(in) fvec )
```

Associate a Fortran pointer with the data stored inside a GSL vector object. This is invoked via the generic fgsl_vector_align. Objects of type `gsl_vector_complex` which are returned by GSL routines often are persistent subobjects of other GSL objects. A Fortran pointer aligned with a subobject hence will remain up-to-date throughout the lifetime of the object; it may become undefined once the object ceases to exist.

Parameters

ptr	- rank 1 Fortran pointer
fvec	- double precision complex GSL vector

Returns

Status

49.1.1.29 fgsl_vector_complex_status()

```
logical function fgsl_vector_complex_status (
            type(fgsl_vector_complex), intent(in) vector_complex )
```

49.1.1.30 fgsl_vector_complex_to_array()

```
subroutine fgsl_vector_complex_to_array (
            complex(fgsl_double_complex), dimension(:), intent(inout) result,
            type(fgsl_vector_complex), intent(in) source )
```

The assignment operator (see interface/generics.finc) is overloaded to enable copying of the content of a complex GSL vector into a Fortran array.

49.1.1.31 fgsl_vector_free()

```
subroutine fgsl_vector_free (
            type(fgsl_vector), intent(inout) fvec )
```

Free the resources inside a GSL vector object previously established by a call to fgsl_vector_init(). This is invoked via the generic fgsl_vector_free.

49.1.1.32 fgsl_vector_get_size()

```
integer(fgsl_size_t) function fgsl_vector_get_size (
            type(fgsl_vector), intent(in) vec )
```

49.1.1.33 fgsl_vector_get_stride()

```
integer(fgsl_size_t) function fgsl_vector_get_stride (
            type(fgsl_vector), intent(in) vec )
```

49.1.1.34 fgsl_vector_init()

```
type(fgsl_vector) function fgsl_vector_init (
            real(fgsl_double), dimension(:), intent(in), target, contiguous array,
            integer(fgsl_size_t), intent(in), optional stride,
            integer(fgsl_int), intent(inout), optional stat )
```

Initialize a GSL vector object. This is invoked via the generic fgsl_vector_init.

Parameters

in	*array.*	The result variable's block is aliased to this contiguous array or a section of it. The actual argument must be a CONTIGUOUS array with the TARGET attribute. It can be of type integer(fgsl_int) or real(fgsl_double).
in	*stride.*	If present, the stride between subsequent array elements of the function result. Otherwise, the value one is assumed.
in,out	*status.*	If present, the exit status.

49.1.1.35 fgsl_vector_init_legacy()

```
type(fgsl_vector) function fgsl_vector_init_legacy (
            real(fgsl_double), intent(in) type )
```

Legacy specific fgsl_vector_init of for GSL vector initialization.

Parameters

type	- determine intrinsic type of vector object

Returns

new object of type fgsl_vector

49.1.1.36 fgsl_vector_int_free()

```
subroutine fgsl_vector_int_free (
            type(fgsl_vector_int), intent(inout) fvec )
```

49.1.1.37 fgsl_vector_int_init()

```
type(fgsl_vector_int) function fgsl_vector_int_init (
             integer(fgsl_int), dimension(:), intent(in), target, contiguous array,
             integer(fgsl_size_t), intent(in), optional stride,
             integer(fgsl_int), intent(inout), optional stat )
```

49.1.1.38 fgsl_vector_int_status()

```
logical function fgsl_vector_int_status (
             type(fgsl_vector_int), intent(in) vector )
```

Inquire the size of a double precision real GSL vector object.

49.1.1.39 fgsl_vector_int_to_fptr()

```
integer(fgsl_int) function, dimension(:), pointer fgsl_vector_int_to_fptr (
             type(fgsl_vector_int), intent(in) fvec )
```

49.1.1.40 fgsl_vector_pointer_align()

```
integer(fgsl_int) function fgsl_vector_pointer_align (
             real(fgsl_double), dimension(:), intent(out), pointer ptr,
             type(fgsl_vector), intent(in) fvec )
```

Legacy function to associate a Fortran pointer with the data stored inside a GSL vector object. Codes should be updated to use fgsl_vector_ptr. This is invoked via the generic fgsl_vector_align. Objects of type `gsl_vector` which are returned by GSL routines often are persistent subobjects of other GSL objects. A Fortran pointer aligned with a subobject hence will remain up-to-date throughout the lifetime of the object; it may become undefined once the object ceases to exist.

Parameters

ptr	- rank 1 Fortran pointer
fvec	- double precision real GSL vector

Returns

Status

49.1.1.41 fgsl_vector_status()

```
logical function fgsl_vector_status (
             type(fgsl_vector), intent(in) vector )
```

49.1.1.42 fgsl_vector_to_array()

```
subroutine fgsl_vector_to_array (
             real(fgsl_double), dimension(:), intent(inout) result,
             type(fgsl_vector), intent(in) source )
```

The assignment operator (see interface/generics.finc) is overloaded to enable copying of the content of a GSL vector into a Fortran array.

49.1.1.43 fgsl_vector_to_fptr()

```
real(fgsl_double) function, dimension(:), pointer fgsl_vector_to_fptr (
             type(fgsl_vector), intent(in) fvec )
```

Function to associate a Fortran pointer with a GSL vector object.

Parameters

in	*fvec.*	double precision real GSL vector The function result is a null pointer if the object is invalid, otherwise it points to the data described by the fvec object

49.2 api/bspline.finc File Reference

Functions/Subroutines

- type(fgsl_bspline_workspace) function fgsl_bspline_alloc (k, nbreak)
- subroutine fgsl_bspline_free (w)
- integer(fgsl_int) function fgsl_bspline_knots (breakpts, w)
- integer(fgsl_int) function fgsl_bspline_knots_uniform (a, b, w)
- integer(fgsl_int) function fgsl_bspline_eval (x, b, w)
- integer(fgsl_int) function fgsl_bspline_eval_nonzero (x, bk, istart, iend, w)
- integer(fgsl_int) function fgsl_bspline_deriv_eval (x, nderiv, db, w)
- integer(fgsl_int) function fgsl_bspline_deriv_eval_nonzero (x, nderiv, db, istart, iend, w)
- integer(fgsl_size_t) function fgsl_bspline_ncoeffs (w)
- real(fgsl_double) function fgsl_bspline_greville_abscissa (i, w)
- integer(fgsl_int) function fgsl_bspline_knots_greville (abscissae, w, abserr)

49.2.1 Function/Subroutine Documentation

49.2.1.1 fgsl_bspline_alloc()

```
type(fgsl_bspline_workspace) function fgsl_bspline_alloc (
             integer(fgsl_size_t), intent(in) k,
             integer(fgsl_size_t), intent(in) nbreak )
```

49.2.1.2 fgsl_bspline_deriv_eval()

```
integer(fgsl_int) function fgsl_bspline_deriv_eval (
             real(fgsl_double), intent(in) x,
             integer(fgsl_size_t), intent(in) nderiv,
             type(fgsl_matrix), intent(inout) db,
             type(fgsl_bspline_workspace), intent(inout) w )
```

49.2.1.3 fgsl_bspline_deriv_eval_nonzero()

```
integer(fgsl_int) function fgsl_bspline_deriv_eval_nonzero (
             real(fgsl_double), intent(in) x,
             integer(fgsl_size_t), intent(in) nderiv,
             type(fgsl_matrix), intent(inout) db,
             integer(fgsl_size_t), intent(inout) istart,
             integer(fgsl_size_t), intent(inout) iend,
             type(fgsl_bspline_workspace), intent(inout) w )
```

49.2.1.4 fgsl_bspline_eval()

```
integer(fgsl_int) function fgsl_bspline_eval (
             real(fgsl_double), intent(in) x,
             type(fgsl_vector), intent(inout) b,
             type(fgsl_bspline_workspace), intent(inout) w )
```

49.2.1.5 fgsl_bspline_eval_nonzero()

```
integer(fgsl_int) function fgsl_bspline_eval_nonzero (
             real(fgsl_double), intent(in) x,
             type(fgsl_vector), intent(inout) bk,
             integer(fgsl_size_t), intent(inout) istart,
             integer(fgsl_size_t), intent(inout) iend,
             type(fgsl_bspline_workspace), intent(inout) w )
```

49.2.1.6 fgsl_bspline_free()

```
subroutine fgsl_bspline_free (
             type(fgsl_bspline_workspace), intent(inout) w )
```

49.2.1.7 fgsl_bspline_greville_abscissa()

```
real(fgsl_double) function fgsl_bspline_greville_abscissa (
             integer(fgsl_size_t) i,
             type(fgsl_bspline_workspace), intent(in) w )
```

49.2.1.8 fgsl_bspline_knots()

```
integer(fgsl_int) function fgsl_bspline_knots (
             type(fgsl_vector), intent(in) breakpts,
             type(fgsl_bspline_workspace), intent(inout) w )
```

49.2.1.9 fgsl_bspline_knots_greville()

```
integer(fgsl_int) function fgsl_bspline_knots_greville (
             type(fgsl_vector) abscissae,
             type(fgsl_bspline_workspace) w,
             real(fgsl_double), intent(out) abserr )
```

49.2.1.10 fgsl_bspline_knots_uniform()

```
integer(fgsl_int) function fgsl_bspline_knots_uniform (
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b,
             type(fgsl_bspline_workspace), intent(inout) w )
```

49.2.1.11 fgsl_bspline_ncoeffs()

```
integer(fgsl_size_t) function fgsl_bspline_ncoeffs (
             type(fgsl_bspline_workspace), intent(inout) w )
```

49.3 api/chebyshev.finc File Reference

Functions/Subroutines

- type(fgsl_cheb_series) function fgsl_cheb_alloc (n)
- subroutine fgsl_cheb_free (cs)
- integer(fgsl_int) function fgsl_cheb_init (cs, f, a, b)
- integer(fgsl_size_t) function fgsl_cheb_order (cs)
- integer(fgsl_size_t) function fgsl_cheb_size (cs)
- real(fgsl_double) function, dimension(:), pointer fgsl_cheb_coeffs (cs)
- real(fgsl_double) function fgsl_cheb_eval (cs, x)
- integer(fgsl_int) function fgsl_cheb_eval_err (cs, x, result, abserr)
- real(fgsl_double) function fgsl_cheb_eval_n (cs, order, x)
- integer(fgsl_int) function fgsl_cheb_eval_n_err (cs, order, x, result, abserr)
- integer(fgsl_int) function fgsl_cheb_calc_deriv (deriv, cs)
- integer(fgsl_int) function fgsl_cheb_calc_integ (integ, cs)
- logical function fgsl_cheb_series_status (cheb_series)

49.3.1 Function/Subroutine Documentation

49.3.1.1 fgsl_cheb_alloc()

```
type(fgsl_cheb_series) function fgsl_cheb_alloc (
             integer(fgsl_int), intent(in) n )
```

49.3.1.2 fgsl_cheb_calc_deriv()

```
integer(fgsl_int) function fgsl_cheb_calc_deriv (
             type(fgsl_cheb_series), intent(inout) deriv,
             type(fgsl_cheb_series), intent(in) cs )
```

49.3.1.3 fgsl_cheb_calc_integ()

```
integer(fgsl_int) function fgsl_cheb_calc_integ (
             type(fgsl_cheb_series), intent(inout) integ,
             type(fgsl_cheb_series), intent(in) cs )
```

49.3.1.4 fgsl_cheb_coeffs()

```
real(fgsl_double) function, dimension(:), pointer fgsl_cheb_coeffs (
            type(fgsl_cheb_series), intent(in) cs )
```

49.3.1.5 fgsl_cheb_eval()

```
real(fgsl_double) function fgsl_cheb_eval (
            type(fgsl_cheb_series), intent(in) cs,
            real(fgsl_double), intent(in) x )
```

49.3.1.6 fgsl_cheb_eval_err()

```
integer(fgsl_int) function fgsl_cheb_eval_err (
            type(fgsl_cheb_series), intent(in) cs,
            real(fgsl_double), intent(in) x,
            real(fgsl_double), intent(out) result,
            real(fgsl_double), intent(out) abserr )
```

49.3.1.7 fgsl_cheb_eval_n()

```
real(fgsl_double) function fgsl_cheb_eval_n (
            type(fgsl_cheb_series), intent(in) cs,
            integer(fgsl_size_t), intent(in) order,
            real(fgsl_double), intent(in) x )
```

49.3.1.8 fgsl_cheb_eval_n_err()

```
integer(fgsl_int) function fgsl_cheb_eval_n_err (
            type(fgsl_cheb_series), intent(in) cs,
            integer(fgsl_size_t), intent(in) order,
            real(fgsl_double), intent(in) x,
            real(fgsl_double), intent(out) result,
            real(fgsl_double), intent(out) abserr )
```

49.3.1.9 fgsl_cheb_free()

```
subroutine fgsl_cheb_free (
            type(fgsl_cheb_series), intent(in) cs )
```

49.3.1.10 fgsl_cheb_init()

```
integer(fgsl_int) function fgsl_cheb_init (
             type(fgsl_cheb_series), intent(inout) cs,
             type(fgsl_function), intent(in) f,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.3.1.11 fgsl_cheb_order()

```
integer(fgsl_size_t) function fgsl_cheb_order (
             type(fgsl_cheb_series), intent(in) cs )
```

49.3.1.12 fgsl_cheb_series_status()

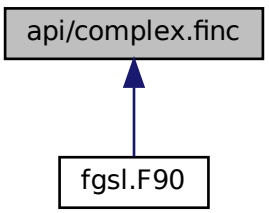
```
logical function fgsl_cheb_series_status (
             type(fgsl_cheb_series), intent(in) cheb_series )
```

49.3.1.13 fgsl_cheb_size()

```
integer(fgsl_size_t) function fgsl_cheb_size (
             type(fgsl_cheb_series), intent(in) cs )
```

49.4 api/complex.finc File Reference

This graph shows which files directly or indirectly include this file:



Functions/Subroutines

- real(fgsl_double) function fgsl_complex_arg (z)
- real(fgsl_double) function fgsl_complex_logabs (z)
- complex(fgsl_double_complex) function fgsl_complex_log10 (z)
- complex(fgsl_double_complex) function fgsl_complex_log_b (z, b)
- complex(fgsl_double_complex) function fgsl_complex_arcsin (z)
- complex(fgsl_double_complex) function fgsl_complex_arcsin_real (r)
- complex(fgsl_double_complex) function fgsl_complex_arccos (z)
- complex(fgsl_double_complex) function fgsl_complex_arccos_real (r)
- complex(fgsl_double_complex) function fgsl_complex_arctan (z)
- complex(fgsl_double_complex) function fgsl_complex_arcsec (z)
- complex(fgsl_double_complex) function fgsl_complex_arcsec_real (r)
- complex(fgsl_double_complex) function fgsl_complex_arccsc (z)
- complex(fgsl_double_complex) function fgsl_complex_arccsc_real (r)
- complex(fgsl_double_complex) function fgsl_complex_arccot (z)
- complex(fgsl_double_complex) function fgsl_complex_arcsinh (z)
- complex(fgsl_double_complex) function fgsl_complex_arccosh (z)
- complex(fgsl_double_complex) function fgsl_complex_arccosh_real (r)
- complex(fgsl_double_complex) function fgsl_complex_arctanh (z)
- complex(fgsl_double_complex) function fgsl_complex_arctanh_real (r)
- complex(fgsl_double_complex) function fgsl_complex_arcsech (z)
- complex(fgsl_double_complex) function fgsl_complex_arccsch (z)
- complex(fgsl_double_complex) function fgsl_complex_arccoth (z)
- elemental subroutine fgsl_complex_to_complex (result, source)
- elemental subroutine complex_to_fgsl_complex (result, source)

49.4.1 Function/Subroutine Documentation

49.4.1.1 complex_to_fgsl_complex()

```
elemental subroutine complex_to_fgsl_complex (
            type(gsl_complex), intent(out) result,
            complex(fgsl_double_complex), intent(in) source )
```

49.4.1.2 fgsl_complex_arccos()

```
complex(fgsl_double_complex) function fgsl_complex_arccos (
            complex(fgsl_double_complex), intent(in) z )
```

49.4.1.3 fgsl_complex_arccos_real()

```
complex(fgsl_double_complex) function fgsl_complex_arccos_real (
            real(fgsl_double), intent(in) r )
```

49.4.1.4 fgsl_complex_arccosh()

```
complex(fgsl_double_complex) function fgsl_complex_arccosh (
             complex(fgsl_double_complex), intent(in) z )
```

49.4.1.5 fgsl_complex_arccosh_real()

```
complex(fgsl_double_complex) function fgsl_complex_arccosh_real (
             real(fgsl_double), intent(in) r )
```

49.4.1.6 fgsl_complex_arccot()

```
complex(fgsl_double_complex) function fgsl_complex_arccot (
             complex(fgsl_double_complex), intent(in) z )
```

49.4.1.7 fgsl_complex_arccoth()

```
complex(fgsl_double_complex) function fgsl_complex_arccoth (
             complex(fgsl_double_complex), intent(in) z )
```

49.4.1.8 fgsl_complex_arccsc()

```
complex(fgsl_double_complex) function fgsl_complex_arccsc (
             complex(fgsl_double_complex), intent(in) z )
```

49.4.1.9 fgsl_complex_arccsc_real()

```
complex(fgsl_double_complex) function fgsl_complex_arccsc_real (
             real(fgsl_double), intent(in) r )
```

49.4.1.10 fgsl_complex_arccsch()

```
complex(fgsl_double_complex) function fgsl_complex_arccsch (
             complex(fgsl_double_complex), intent(in) z )
```

49.4.1.11 fgsl_complex_arcsec()

```
complex(fgsl_double_complex) function fgsl_complex_arcsec (
             complex(fgsl_double_complex), intent(in) z )
```

49.4.1.12 fgsl_complex_arcsec_real()

```
complex(fgsl_double_complex) function fgsl_complex_arcsec_real (
             real(fgsl_double), intent(in) r )
```

49.4.1.13 fgsl_complex_arcsech()

```
complex(fgsl_double_complex) function fgsl_complex_arcsech (
             complex(fgsl_double_complex), intent(in) z )
```

49.4.1.14 fgsl_complex_arcsin()

```
complex(fgsl_double_complex) function fgsl_complex_arcsin (
             complex(fgsl_double_complex), intent(in) z )
```

49.4.1.15 fgsl_complex_arcsin_real()

```
complex(fgsl_double_complex) function fgsl_complex_arcsin_real (
             real(fgsl_double), intent(in) r )
```

49.4.1.16 fgsl_complex_arcsinh()

```
complex(fgsl_double_complex) function fgsl_complex_arcsinh (
             complex(fgsl_double_complex), intent(in) z )
```

49.4.1.17 fgsl_complex_arctan()

```
complex(fgsl_double_complex) function fgsl_complex_arctan (
             complex(fgsl_double_complex), intent(in) z )
```

49.4.1.18 fgsl_complex_arctanh()

```
complex(fgsl_double_complex) function fgsl_complex_arctanh (
             complex(fgsl_double_complex), intent(in) z )
```

49.4.1.19 fgsl_complex_arctanh_real()

```
complex(fgsl_double_complex) function fgsl_complex_arctanh_real (
             real(fgsl_double), intent(in) r )
```

49.4.1.20 fgsl_complex_arg()

```
real(fgsl_double) function fgsl_complex_arg (
             complex(fgsl_double_complex), intent(in) z )
```

49.4.1.21 fgsl_complex_log10()

```
complex(fgsl_double_complex) function fgsl_complex_log10 (
             complex(fgsl_double_complex), intent(in) z )
```

49.4.1.22 fgsl_complex_log_b()

```
complex(fgsl_double_complex) function fgsl_complex_log_b (
             complex(fgsl_double_complex), intent(in) z,
             complex(fgsl_double_complex), intent(in) b )
```

49.4.1.23 fgsl_complex_logabs()

```
real(fgsl_double) function fgsl_complex_logabs (
             complex(fgsl_double_complex), intent(in) z )
```

49.4.1.24 fgsl_complex_to_complex()

```
elemental subroutine fgsl_complex_to_complex (
             complex(fgsl_double_complex), intent(out) result,
             type(gsl_complex), intent(in) source )
```

49.5 api/deriv.finc File Reference

Functions/Subroutines

- integer(fgsl_int) function fgsl_deriv_central (f, x, h, result, abserr)
- integer(fgsl_int) function fgsl_deriv_forward (f, x, h, result, abserr)
- integer(fgsl_int) function fgsl_deriv_backward (f, x, h, result, abserr)

49.5.1 Function/Subroutine Documentation

49.5.1.1 fgsl_deriv_backward()

```
integer(fgsl_int) function fgsl_deriv_backward (
             type(fgsl_function), intent(in) f,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) h,
             real(fgsl_double), intent(out) result,
             real(fgsl_double), intent(out) abserr )
```

49.5.1.2 fgsl_deriv_central()

```
integer(fgsl_int) function fgsl_deriv_central (
             type(fgsl_function), intent(in) f,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) h,
             real(fgsl_double), intent(out) result,
             real(fgsl_double), intent(out) abserr )
```

49.5.1.3 fgsl_deriv_forward()

```
integer(fgsl_int) function fgsl_deriv_forward (
             type(fgsl_function), intent(in) f,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) h,
             real(fgsl_double), intent(out) result,
             real(fgsl_double), intent(out) abserr )
```

49.6 api/dht.finc File Reference

Functions/Subroutines

- type(fgsl_dht) function fgsl_dht_alloc (size)
- integer(fgsl_int) function fgsl_dht_init (t, nu, xmax)
- type(fgsl_dht) function fgsl_dht_new (size, nu, xmax)
- subroutine fgsl_dht_free (t)
- integer(fgsl_int) function fgsl_dht_apply (t, f_in, f_out)
- real(fgsl_double) function fgsl_dht_x_sample (t, n)
- real(fgsl_double) function fgsl_dht_k_sample (t, n)
- logical function fgsl_dht_status (dht)

49.6.1 Function/Subroutine Documentation

49.6.1.1 fgsl_dht_alloc()

```
type(fgsl_dht) function fgsl_dht_alloc (
             integer(fgsl_size_t), intent(in) size )
```

49.6.1.2 fgsl_dht_apply()

```
integer(fgsl_int) function fgsl_dht_apply (
             type(fgsl_dht), intent(in) t,
             real(fgsl_double), dimension(:), intent(in), target, contiguous f_in,
             real(fgsl_double), dimension(:), intent(out), target, contiguous f_out )
```

49.6.1.3 fgsl_dht_free()

```
subroutine fgsl_dht_free (
             type(fgsl_dht), intent(inout) t )
```

49.6.1.4 fgsl_dht_init()

```
integer(fgsl_int) function fgsl_dht_init (
             type(fgsl_dht), intent(inout) t,
             real(fgsl_double), intent(in) nu,
             real(fgsl_double), intent(in) xmax )
```

49.6.1.5 fgsl_dht_k_sample()

```
real(fgsl_double) function fgsl_dht_k_sample (
             type(fgsl_dht), intent(in) t,
             integer(fgsl_int), intent(in) n )
```

49.6.1.6 fgsl_dht_new()

```
type(fgsl_dht) function fgsl_dht_new (
             integer(fgsl_size_t), intent(in) size,
             real(fgsl_double), intent(in) nu,
             real(fgsl_double), intent(in) xmax )
```

49.6.1.7 fgsl_dht_status()

```
logical function fgsl_dht_status (
             type(fgsl_dht), intent(in) dht )
```

49.6.1.8 fgsl_dht_x_sample()

```
real(fgsl_double) function fgsl_dht_x_sample (
             type(fgsl_dht), intent(in) t,
             integer(fgsl_int), intent(in) n )
```

49.7 api/eigen.finc File Reference

Functions/Subroutines

- type(fgsl_eigen_symm_workspace) function fgsl_eigen_symm_alloc (n)
- subroutine fgsl_eigen_symm_free (w)
- integer(fgsl_int) function fgsl_eigen_symm (a, eval, w)
- type(fgsl_eigen_symmv_workspace) function fgsl_eigen_symmv_alloc (n)
- subroutine fgsl_eigen_symmv_free (w)
- integer(fgsl_int) function fgsl_eigen_symmv (a, eval, evec, w)
- type(fgsl_eigen_herm_workspace) function fgsl_eigen_herm_alloc (n)
- subroutine fgsl_eigen_herm_free (w)
- integer(fgsl_int) function fgsl_eigen_herm (a, eval, w)
- type(fgsl_eigen_hermv_workspace) function fgsl_eigen_hermv_alloc (n)
- subroutine fgsl_eigen_hermv_free (w)
- integer(fgsl_int) function fgsl_eigen_hermv (a, eval, evec, w)
- type(fgsl_eigen_nonsymm_workspace) function fgsl_eigen_nonsymm_alloc (n)
- subroutine fgsl_eigen_nonsymm_free (w)
- subroutine fgsl_eigen_nonsymm_params (compute_t, balance, w)

- integer(fgsl_int) function fgsl_eigen_nonsymm (a, eval, w)
- integer(fgsl_int) function fgsl_eigen_nonsymm_z (a, eval, z, w)
- type(fgsl_eigen_nonsymmv_workspace) function fgsl_eigen_nonsymmv_alloc (n)
- subroutine fgsl_eigen_nonsymmv_free (w)
- subroutine fgsl_eigen_nonsymmv_params (balance, w)
- integer(fgsl_int) function fgsl_eigen_nonsymmv (a, eval, evec, w)
- integer(fgsl_int) function fgsl_eigen_nonsymmv_z (a, eval, evec, z, w)
- type(fgsl_eigen_gensymm_workspace) function fgsl_eigen_gensymm_alloc (n)
- subroutine fgsl_eigen_gensymm_free (w)
- integer(fgsl_int) function fgsl_eigen_gensymm (a, b, eval, w)
- type(fgsl_eigen_gensymmv_workspace) function fgsl_eigen_gensymmv_alloc (n)
- subroutine fgsl_eigen_gensymmv_free (w)
- integer(fgsl_int) function fgsl_eigen_gensymmv (a, b, eval, evec, w)
- type(fgsl_eigen_genherm_workspace) function fgsl_eigen_genherm_alloc (n)
- subroutine fgsl_eigen_genherm_free (w)
- integer(fgsl_int) function fgsl_eigen_genherm (a, b, eval, w)
- type(fgsl_eigen_genhermv_workspace) function fgsl_eigen_genhermv_alloc (n)
- subroutine fgsl_eigen_genhermv_free (w)
- integer(fgsl_int) function fgsl_eigen_genhermv (a, b, eval, evec, w)
- type(fgsl_eigen_gen_workspace) function fgsl_eigen_gen_alloc (n)
- subroutine fgsl_eigen_gen_free (w)
- subroutine fgsl_eigen_gen_params (compute_s, compute_t, balance, w)
- integer(fgsl_int) function fgsl_eigen_gen (a, b, alpha, beta, w)
- integer(fgsl_int) function fgsl_eigen_gen_qz (a, b, alpha, beta, q, z, w)
- type(fgsl_eigen_genv_workspace) function fgsl_eigen_genv_alloc (n)
- subroutine fgsl_eigen_genv_free (w)
- integer(fgsl_int) function fgsl_eigen_genv (a, b, alpha, beta, evec, w)
- integer(fgsl_int) function fgsl_eigen_genv_qz (a, b, alpha, beta, evec, q, z, w)
- integer(fgsl_int) function fgsl_eigen_symmv_sort (eval, evec, sort_type)
- integer(fgsl_int) function fgsl_eigen_hermv_sort (eval, evec, sort_type)
- integer(fgsl_int) function fgsl_eigen_nonsymmv_sort (eval, evec, sort_type)
- integer(fgsl_int) function fgsl_eigen_gensymmv_sort (eval, evec, sort_type)
- integer(fgsl_int) function fgsl_eigen_genhermv_sort (eval, evec, sort_type)
- integer(fgsl_int) function fgsl_eigen_genv_sort (alpha, beta, evec, sort_type)

49.7.1 Function/Subroutine Documentation

49.7.1.1 fgsl_eigen_gen()

```
integer(fgsl_int) function fgsl_eigen_gen (
             type(fgsl_matrix), intent(inout) a,
             type(fgsl_matrix), intent(inout) b,
             type(fgsl_vector_complex), intent(inout) alpha,
             type(fgsl_vector), intent(inout) beta,
             type(fgsl_eigen_gen_workspace) w )
```

49.7.1.2 fgsl_eigen_gen_alloc()

```
type(fgsl_eigen_gen_workspace) function fgsl_eigen_gen_alloc (
            integer(fgsl_size_t), intent(in) n )
```

49.7.1.3 fgsl_eigen_gen_free()

```
subroutine fgsl_eigen_gen_free (
            type(fgsl_eigen_gen_workspace) w )
```

49.7.1.4 fgsl_eigen_gen_params()

```
subroutine fgsl_eigen_gen_params (
            integer(fgsl_int), intent(in) compute_s,
            integer(fgsl_int), intent(in) compute_t,
            integer(fgsl_int), intent(in) balance,
            type(fgsl_eigen_gen_workspace), intent(inout) w )
```

49.7.1.5 fgsl_eigen_gen_qz()

```
integer(fgsl_int) function fgsl_eigen_gen_qz (
            type(fgsl_matrix), intent(inout) a,
            type(fgsl_matrix), intent(inout) b,
            type(fgsl_vector_complex), intent(inout) alpha,
            type(fgsl_vector), intent(inout) beta,
            type(fgsl_matrix), intent(inout) q,
            type(fgsl_matrix), intent(inout) z,
            type(fgsl_eigen_gen_workspace) w )
```

49.7.1.6 fgsl_eigen_genherm()

```
integer(fgsl_int) function fgsl_eigen_genherm (
            type(fgsl_matrix_complex), intent(inout) a,
            type(fgsl_matrix_complex), intent(inout) b,
            type(fgsl_vector), intent(inout) eval,
            type(fgsl_eigen_genherm_workspace) w )
```

49.7.1.7 fgsl_eigen_genherm_alloc()

```
type(fgsl_eigen_genherm_workspace) function fgsl_eigen_genherm_alloc (
            integer(fgsl_size_t), intent(in) n )
```

49.7.1.8 fgsl_eigen_genherm_free()

```
subroutine fgsl_eigen_genherm_free (
            type(fgsl_eigen_genherm_workspace) w )
```

49.7.1.9 fgsl_eigen_genhermv()

```
integer(fgsl_int) function fgsl_eigen_genhermv (
            type(fgsl_matrix_complex), intent(inout) a,
            type(fgsl_matrix_complex), intent(inout) b,
            type(fgsl_vector), intent(inout) eval,
            type(fgsl_matrix_complex), intent(inout) evec,
            type(fgsl_eigen_genhermv_workspace) w )
```

49.7.1.10 fgsl_eigen_genhermv_alloc()

```
type(fgsl_eigen_genhermv_workspace) function fgsl_eigen_genhermv_alloc (
            integer(fgsl_size_t), intent(in) n )
```

49.7.1.11 fgsl_eigen_genhermv_free()

```
subroutine fgsl_eigen_genhermv_free (
            type(fgsl_eigen_genhermv_workspace) w )
```

49.7.1.12 fgsl_eigen_genhermv_sort()

```
integer(fgsl_int) function fgsl_eigen_genhermv_sort (
            type(fgsl_vector), intent(inout) eval,
            type(fgsl_matrix_complex), intent(inout) evec,
            integer(fgsl_int), intent(in) sort_type )
```

49.7.1.13 fgsl_eigen_gensymm()

```
integer(fgsl_int) function fgsl_eigen_gensymm (
             type(fgsl_matrix), intent(inout) a,
             type(fgsl_matrix), intent(inout) b,
             type(fgsl_vector), intent(inout) eval,
             type(fgsl_eigen_gensymm_workspace) w )
```

49.7.1.14 fgsl_eigen_gensymm_alloc()

```
type(fgsl_eigen_gensymm_workspace) function fgsl_eigen_gensymm_alloc (
             integer(fgsl_size_t), intent(in) n )
```

49.7.1.15 fgsl_eigen_gensymm_free()

```
subroutine fgsl_eigen_gensymm_free (
             type(fgsl_eigen_gensymm_workspace) w )
```

49.7.1.16 fgsl_eigen_gensymmv()

```
integer(fgsl_int) function fgsl_eigen_gensymmv (
             type(fgsl_matrix), intent(inout) a,
             type(fgsl_matrix), intent(inout) b,
             type(fgsl_vector), intent(inout) eval,
             type(fgsl_matrix), intent(inout) evec,
             type(fgsl_eigen_gensymmv_workspace) w )
```

49.7.1.17 fgsl_eigen_gensymmv_alloc()

```
type(fgsl_eigen_gensymmv_workspace) function fgsl_eigen_gensymmv_alloc (
             integer(fgsl_size_t), intent(in) n )
```

49.7.1.18 fgsl_eigen_gensymmv_free()

```
subroutine fgsl_eigen_gensymmv_free (
             type(fgsl_eigen_gensymmv_workspace) w )
```

49.7.1.19 fgsl_eigen_gensymmv_sort()

```
integer(fgsl_int) function fgsl_eigen_gensymmv_sort (
             type(fgsl_vector), intent(inout) eval,
             type(fgsl_matrix), intent(inout) evec,
             integer(fgsl_int), intent(in) sort_type )
```

49.7.1.20 fgsl_eigen_genv()

```
integer(fgsl_int) function fgsl_eigen_genv (
             type(fgsl_matrix), intent(inout) a,
             type(fgsl_matrix), intent(inout) b,
             type(fgsl_vector_complex), intent(inout) alpha,
             type(fgsl_vector), intent(inout) beta,
             type(fgsl_matrix_complex), intent(inout) evec,
             type(fgsl_eigen_genv_workspace) w )
```

49.7.1.21 fgsl_eigen_genv_alloc()

```
type(fgsl_eigen_genv_workspace) function fgsl_eigen_genv_alloc (
             integer(fgsl_size_t), intent(in) n )
```

49.7.1.22 fgsl_eigen_genv_free()

```
subroutine fgsl_eigen_genv_free (
             type(fgsl_eigen_genv_workspace) w )
```

49.7.1.23 fgsl_eigen_genv_qz()

```
integer(fgsl_int) function fgsl_eigen_genv_qz (
             type(fgsl_matrix), intent(inout) a,
             type(fgsl_matrix), intent(inout) b,
             type(fgsl_vector_complex), intent(inout) alpha,
             type(fgsl_vector), intent(inout) beta,
             type(fgsl_matrix_complex), intent(inout) evec,
             type(fgsl_matrix), intent(inout) q,
             type(fgsl_matrix), intent(inout) z,
             type(fgsl_eigen_genv_workspace) w )
```

49.7.1.24 fgsl_eigen_genv_sort()

```
integer(fgsl_int) function fgsl_eigen_genv_sort (
             type(fgsl_vector_complex), intent(inout) alpha,
             type(fgsl_vector), intent(inout) beta,
             type(fgsl_matrix_complex), intent(inout) evec,
             integer(fgsl_int), intent(in) sort_type )
```

49.7.1.25 fgsl_eigen_herm()

```
integer(fgsl_int) function fgsl_eigen_herm (
             type(fgsl_matrix_complex), intent(inout) a,
             type(fgsl_vector), intent(inout) eval,
             type(fgsl_eigen_herm_workspace) w )
```

49.7.1.26 fgsl_eigen_herm_alloc()

```
type(fgsl_eigen_herm_workspace) function fgsl_eigen_herm_alloc (
             integer(fgsl_size_t), intent(in) n )
```

49.7.1.27 fgsl_eigen_herm_free()

```
subroutine fgsl_eigen_herm_free (
             type(fgsl_eigen_herm_workspace) w )
```

49.7.1.28 fgsl_eigen_hermv()

```
integer(fgsl_int) function fgsl_eigen_hermv (
             type(fgsl_matrix_complex), intent(inout) a,
             type(fgsl_vector), intent(inout) eval,
             type(fgsl_matrix_complex), intent(inout) evec,
             type(fgsl_eigen_hermv_workspace) w )
```

49.7.1.29 fgsl_eigen_hermv_alloc()

```
type(fgsl_eigen_hermv_workspace) function fgsl_eigen_hermv_alloc (
             integer(fgsl_size_t), intent(in) n )
```

49.7.1.30 fgsl_eigen_hermv_free()

```
subroutine fgsl_eigen_hermv_free (
             type(fgsl_eigen_hermv_workspace) w )
```

49.7.1.31 fgsl_eigen_hermv_sort()

```
integer(fgsl_int) function fgsl_eigen_hermv_sort (
             type(fgsl_vector), intent(inout) eval,
             type(fgsl_matrix_complex), intent(inout) evec,
             integer(fgsl_int), intent(in) sort_type )
```

49.7.1.32 fgsl_eigen_nonsymm()

```
integer(fgsl_int) function fgsl_eigen_nonsymm (
             type(fgsl_matrix), intent(inout) a,
             type(fgsl_vector_complex), intent(inout) eval,
             type(fgsl_eigen_nonsymm_workspace) w )
```

49.7.1.33 fgsl_eigen_nonsymm_alloc()

```
type(fgsl_eigen_nonsymm_workspace) function fgsl_eigen_nonsymm_alloc (
             integer(fgsl_size_t), intent(in) n )
```

49.7.1.34 fgsl_eigen_nonsymm_free()

```
subroutine fgsl_eigen_nonsymm_free (
             type(fgsl_eigen_nonsymm_workspace) w )
```

49.7.1.35 fgsl_eigen_nonsymm_params()

```
subroutine fgsl_eigen_nonsymm_params (
             integer(fgsl_int), intent(in) compute_t,
             integer(fgsl_int), intent(in) balance,
             type(fgsl_eigen_nonsymm_workspace), intent(inout) w )
```

49.7.1.36 fgsl_eigen_nonsymm_z()

```
integer(fgsl_int) function fgsl_eigen_nonsymm_z (
            type(fgsl_matrix), intent(inout) a,
            type(fgsl_vector_complex), intent(inout) eval,
            type(fgsl_matrix), intent(inout) z,
            type(fgsl_eigen_nonsymm_workspace) w )
```

49.7.1.37 fgsl_eigen_nonsymmv()

```
integer(fgsl_int) function fgsl_eigen_nonsymmv (
            type(fgsl_matrix), intent(inout) a,
            type(fgsl_vector_complex), intent(inout) eval,
            type(fgsl_matrix_complex), intent(inout) evec,
            type(fgsl_eigen_nonsymmv_workspace) w )
```

49.7.1.38 fgsl_eigen_nonsymmv_alloc()

```
type(fgsl_eigen_nonsymmv_workspace) function fgsl_eigen_nonsymmv_alloc (
            integer(fgsl_size_t), intent(in) n )
```

49.7.1.39 fgsl_eigen_nonsymmv_free()

```
subroutine fgsl_eigen_nonsymmv_free (
            type(fgsl_eigen_nonsymmv_workspace) w )
```

49.7.1.40 fgsl_eigen_nonsymmv_params()

```
subroutine fgsl_eigen_nonsymmv_params (
            integer(fgsl_int), intent(in) balance,
            type(fgsl_eigen_nonsymm_workspace), intent(inout) w )
```

49.7.1.41 fgsl_eigen_nonsymmv_sort()

```
integer(fgsl_int) function fgsl_eigen_nonsymmv_sort (
            type(fgsl_vector_complex), intent(inout) eval,
            type(fgsl_matrix_complex), intent(inout) evec,
            integer(fgsl_int), intent(in) sort_type )
```

49.7.1.42 fgsl_eigen_nonsymmv_z()

```
integer(fgsl_int) function fgsl_eigen_nonsymmv_z (
             type(fgsl_matrix), intent(inout) a,
             type(fgsl_vector_complex), intent(inout) eval,
             type(fgsl_matrix_complex), intent(inout) evec,
             type(fgsl_matrix), intent(inout) z,
             type(fgsl_eigen_nonsymmv_workspace) w )
```

49.7.1.43 fgsl_eigen_symm()

```
integer(fgsl_int) function fgsl_eigen_symm (
             type(fgsl_matrix), intent(inout) a,
             type(fgsl_vector), intent(inout) eval,
             type(fgsl_eigen_symm_workspace) w )
```

49.7.1.44 fgsl_eigen_symm_alloc()

```
type(fgsl_eigen_symm_workspace) function fgsl_eigen_symm_alloc (
             integer(fgsl_size_t), intent(in) n )
```

49.7.1.45 fgsl_eigen_symm_free()

```
subroutine fgsl_eigen_symm_free (
             type(fgsl_eigen_symm_workspace) w )
```

49.7.1.46 fgsl_eigen_symmv()

```
integer(fgsl_int) function fgsl_eigen_symmv (
             type(fgsl_matrix), intent(inout) a,
             type(fgsl_vector), intent(inout) eval,
             type(fgsl_matrix), intent(inout) evec,
             type(fgsl_eigen_symmv_workspace) w )
```

49.7.1.47 fgsl_eigen_symmv_alloc()

```
type(fgsl_eigen_symmv_workspace) function fgsl_eigen_symmv_alloc (
             integer(fgsl_size_t), intent(in) n )
```

49.7.1.48 fgsl_eigen_symmv_free()

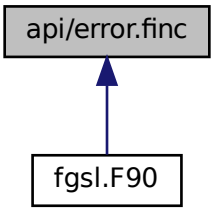
```
subroutine fgsl_eigen_symmv_free (
             type(fgsl_eigen_symmv_workspace) w )
```

49.7.1.49 fgsl_eigen_symmv_sort()

```
integer(fgsl_int) function fgsl_eigen_symmv_sort (
             type(fgsl_vector), intent(inout) eval,
             type(fgsl_matrix), intent(inout) evec,
             integer(fgsl_int), intent(in) sort_type )
```

49.8 api/error.finc File Reference

This graph shows which files directly or indirectly include this file:



Functions/Subroutines

- type(fgsl_error_handler_t) function fgsl_set_error_handler (new_handler)
- type(fgsl_error_handler_t) function fgsl_set_error_handler_off ()
- character(kind=fgsl_char, len=fgsl_strmax) function fgsl_strerror (errno)
- subroutine fgsl_error (reason, file, line, errno)
- logical function fgsl_error_handler_status (error_handler_t)
- type(fgsl_error_handler_t) function fgsl_error_handler_init (handler_sr)

49.8.1 Function/Subroutine Documentation

49.8.1.1 fgsl_error()

```
subroutine fgsl_error (
             character(kind=fgsl_char,len=*), intent(in) reason,
             character(kind=fgsl_char,len=*), intent(in) file,
             integer(fgsl_int), intent(in) line,
             integer(fgsl_int), intent(in) errno )
```

49.8.1.2 fgsl_error_handler_init()

```
type(fgsl_error_handler_t) function fgsl_error_handler_init (
              handler_sr )
```

49.8.1.3 fgsl_error_handler_status()

```
logical function fgsl_error_handler_status (
             type(fgsl_error_handler_t), intent(in) error_handler_t )
```

49.8.1.4 fgsl_set_error_handler()

```
type(fgsl_error_handler_t) function fgsl_set_error_handler (
             type(fgsl_error_handler_t), intent(in) new_handler )
```

49.8.1.5 fgsl_set_error_handler_off()

```
type(fgsl_error_handler_t) function fgsl_set_error_handler_off
```

49.8.1.6 fgsl_strerror()

```
character(kind=fgsl_char,len=fgsl_strmax) function fgsl_strerror (
             integer(fgsl_int), intent(in) errno )
```

49.9 api/fft.finc File Reference

Functions/Subroutines

- integer(fgsl_int) function fgsl_fft_complex_radix2_forward (data, stride, n)
- integer(fgsl_int) function fgsl_fft_complex_radix2_transform (data, stride, n, sign)
- integer(fgsl_int) function fgsl_fft_complex_radix2_backward (data, stride, n)
- integer(fgsl_int) function fgsl_fft_complex_radix2_inverse (data, stride, n)
- integer(fgsl_int) function fgsl_fft_complex_radix2_dif_forward (data, stride, n)
- integer(fgsl_int) function fgsl_fft_complex_radix2_dif_transform (data, stride, n, sign)
- integer(fgsl_int) function fgsl_fft_complex_radix2_dif_backward (data, stride, n)
- integer(fgsl_int) function fgsl_fft_complex_radix2_dif_inverse (data, stride, n)
- type(fgsl_fft_complex_wavetable) function fgsl_fft_complex_wavetable_alloc (n)
- subroutine fgsl_fft_complex_wavetable_free (w)
- type(fgsl_fft_complex_workspace) function fgsl_fft_complex_workspace_alloc (n)
- subroutine fgsl_fft_complex_workspace_free (w)
- integer(fgsl_int) function fgsl_fft_complex_forward (data, stride, n, wavetable, work)
- integer(fgsl_int) function fgsl_fft_complex_transform (data, stride, n, wavetable, work, sign)
- integer(fgsl_int) function fgsl_fft_complex_backward (data, stride, n, wavetable, work)
- integer(fgsl_int) function fgsl_fft_complex_inverse (data, stride, n, wavetable, work)
- integer(fgsl_int) function fgsl_fft_real_radix2_transform (data, stride, n)
- integer(fgsl_int) function fgsl_fft_halfcomplex_radix2_inverse (data, stride, n)
- integer(fgsl_int) function fgsl_fft_halfcomplex_radix2_backward (data, stride, n)
- type(fgsl_fft_real_wavetable) function fgsl_fft_real_wavetable_alloc (n)
- subroutine fgsl_fft_real_wavetable_free (w)
- type(fgsl_fft_halfcomplex_wavetable) function fgsl_fft_halfcomplex_wavetable_alloc (n)
- subroutine fgsl_fft_halfcomplex_wavetable_free (w)
- type(fgsl_fft_real_workspace) function fgsl_fft_real_workspace_alloc (n)
- subroutine fgsl_fft_real_workspace_free (w)
- integer(fgsl_int) function fgsl_fft_real_transform (data, stride, n, wavetable, work)
- integer(fgsl_int) function fgsl_fft_halfcomplex_transform (data, stride, n, wavetable, work)
- integer(fgsl_int) function fgsl_fft_real_unpack (real_coefficient, complex_coefficient, stride, n)
- integer(fgsl_int) function fgsl_fft_halfcomplex_unpack (halfcomplex_coefficient, complex_coefficient, stride, n)

49.9.1 Function/Subroutine Documentation

49.9.1.1 fgsl_fft_complex_backward()

```
integer(fgsl_int) function fgsl_fft_complex_backward (
             complex(fgsl_double_complex), dimension(*), intent(inout), target data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n,
             type(fgsl_fft_complex_wavetable), intent(in) wavetable,
             type(fgsl_fft_complex_workspace) work )
```

49.9.1.2 fgsl_fft_complex_forward()

```
integer(fgsl_int) function fgsl_fft_complex_forward (
             complex(fgsl_double_complex), dimension(*), intent(inout), target data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n,
             type(fgsl_fft_complex_wavetable), intent(in) wavetable,
             type(fgsl_fft_complex_workspace) work )
```

49.9.1.3 fgsl_fft_complex_inverse()

```
integer(fgsl_int) function fgsl_fft_complex_inverse (
             complex(fgsl_double_complex), dimension(*), intent(inout), target data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n,
             type(fgsl_fft_complex_wavetable), intent(in) wavetable,
             type(fgsl_fft_complex_workspace) work )
```

49.9.1.4 fgsl_fft_complex_radix2_backward()

```
integer(fgsl_int) function fgsl_fft_complex_radix2_backward (
             complex(fgsl_double_complex), dimension(*), intent(inout), target data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.9.1.5 fgsl_fft_complex_radix2_dif_backward()

```
integer(fgsl_int) function fgsl_fft_complex_radix2_dif_backward (
             complex(fgsl_double_complex), dimension(*), intent(inout), target data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.9.1.6 fgsl_fft_complex_radix2_dif_forward()

```
integer(fgsl_int) function fgsl_fft_complex_radix2_dif_forward (
             complex(fgsl_double_complex), dimension(*), intent(inout), target data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.9.1.7 fgsl_fft_complex_radix2_dif_inverse()

```
integer(fgsl_int) function fgsl_fft_complex_radix2_dif_inverse (
             complex(fgsl_double_complex), dimension(*), intent(inout), target data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.9.1.8 fgsl_fft_complex_radix2_dif_transform()

```
integer(fgsl_int) function fgsl_fft_complex_radix2_dif_transform (
             complex(fgsl_double_complex), dimension(*), intent(inout), target data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n,
             integer(fgsl_int), intent(in) sign )
```

49.9.1.9 fgsl_fft_complex_radix2_forward()

```
integer(fgsl_int) function fgsl_fft_complex_radix2_forward (
             complex(fgsl_double_complex), dimension(*), intent(inout), target data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.9.1.10 fgsl_fft_complex_radix2_inverse()

```
integer(fgsl_int) function fgsl_fft_complex_radix2_inverse (
             complex(fgsl_double_complex), dimension(*), intent(inout), target data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.9.1.11 fgsl_fft_complex_radix2_transform()

```
integer(fgsl_int) function fgsl_fft_complex_radix2_transform (
             complex(fgsl_double_complex), dimension(*), intent(inout), target data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n,
             integer(fgsl_int), intent(in) sign )
```

49.9.1.12 fgsl_fft_complex_transform()

```
integer(fgsl_int) function fgsl_fft_complex_transform (
             complex(fgsl_double_complex), dimension(*), intent(inout), target data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n,
             type(fgsl_fft_complex_wavetable), intent(in) wavetable,
             type(fgsl_fft_complex_workspace) work,
             integer(fgsl_int), intent(in) sign )
```

49.9.1.13 fgsl_fft_complex_wavetable_alloc()

```
type(fgsl_fft_complex_wavetable) function fgsl_fft_complex_wavetable_alloc (
             integer(fgsl_size_t), intent(in) n )
```

49.9.1.14 fgsl_fft_complex_wavetable_free()

```
subroutine fgsl_fft_complex_wavetable_free (
             type(fgsl_fft_complex_wavetable) w )
```

49.9.1.15 fgsl_fft_complex_workspace_alloc()

```
type(fgsl_fft_complex_workspace) function fgsl_fft_complex_workspace_alloc (
             integer(fgsl_size_t), intent(in) n )
```

49.9.1.16 fgsl_fft_complex_workspace_free()

```
subroutine fgsl_fft_complex_workspace_free (
             type(fgsl_fft_complex_workspace) w )
```

49.9.1.17 fgsl_fft_halfcomplex_radix2_backward()

```
integer(fgsl_int) function fgsl_fft_halfcomplex_radix2_backward (
             real(fgsl_double), dimension(*), intent(inout), target data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.9.1.18 fgsl_fft_halfcomplex_radix2_inverse()

```
integer(fgsl_int) function fgsl_fft_halfcomplex_radix2_inverse (
            real(fgsl_double), dimension(*), intent(inout), target data,
            integer(fgsl_size_t), intent(in) stride,
            integer(fgsl_size_t), intent(in) n )
```

49.9.1.19 fgsl_fft_halfcomplex_transform()

```
integer(fgsl_int) function fgsl_fft_halfcomplex_transform (
            real(fgsl_double), dimension(*), intent(inout), target data,
            integer(fgsl_size_t), intent(in) stride,
            integer(fgsl_size_t), intent(in) n,
            type(fgsl_fft_halfcomplex_wavetable), intent(in) wavetable,
            type(fgsl_fft_real_workspace) work )
```

49.9.1.20 fgsl_fft_halfcomplex_unpack()

```
integer(fgsl_int) function fgsl_fft_halfcomplex_unpack (
            real(fgsl_double), dimension(*), intent(in), target halfcomplex_coefficient,
            complex(fgsl_double_complex), dimension(*), intent(inout), target complex_coefficient,
            integer(fgsl_size_t), intent(in) stride,
            integer(fgsl_size_t), intent(in) n )
```

49.9.1.21 fgsl_fft_halfcomplex_wavetable_alloc()

```
type(fgsl_fft_halfcomplex_wavetable) function fgsl_fft_halfcomplex_wavetable_alloc (
            integer(fgsl_size_t), intent(in) n )
```

49.9.1.22 fgsl_fft_halfcomplex_wavetable_free()

```
subroutine fgsl_fft_halfcomplex_wavetable_free (
            type(fgsl_fft_halfcomplex_wavetable) w )
```

49.9.1.23 fgsl_fft_real_radix2_transform()

```
integer(fgsl_int) function fgsl_fft_real_radix2_transform (
            real(fgsl_double), dimension(*), intent(inout), target data,
            integer(fgsl_size_t), intent(in) stride,
            integer(fgsl_size_t), intent(in) n )
```

49.9.1.24 fgsl_fft_real_transform()

```
integer(fgsl_int) function fgsl_fft_real_transform (
             real(fgsl_double), dimension(*), intent(inout), target data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n,
             type(fgsl_fft_real_wavetable), intent(in) wavetable,
             type(fgsl_fft_real_workspace) work )
```

49.9.1.25 fgsl_fft_real_unpack()

```
integer(fgsl_int) function fgsl_fft_real_unpack (
             real(fgsl_double), dimension(*), intent(in), target real_coefficient,
             complex(fgsl_double_complex), dimension(*), intent(inout), target complex_coefficient,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.9.1.26 fgsl_fft_real_wavetable_alloc()

```
type(fgsl_fft_real_wavetable) function fgsl_fft_real_wavetable_alloc (
             integer(fgsl_size_t), intent(in) n )
```

49.9.1.27 fgsl_fft_real_wavetable_free()

```
subroutine fgsl_fft_real_wavetable_free (
             type(fgsl_fft_real_wavetable) w )
```

49.9.1.28 fgsl_fft_real_workspace_alloc()

```
type(fgsl_fft_real_workspace) function fgsl_fft_real_workspace_alloc (
             integer(fgsl_size_t), intent(in) n )
```

49.9.1.29 fgsl_fft_real_workspace_free()

```
subroutine fgsl_fft_real_workspace_free (
             type(fgsl_fft_real_workspace) w )
```

49.10 api/filter.finc File Reference

Functions/Subroutines

- type(fgsl_filter_gaussian_workspace) function fgsl_filter_gaussian_alloc (k)
- subroutine fgsl_filter_gaussian_free (w)
- integer(fgsl_int) function fgsl_filter_gaussian (endtype, alpha, order, x, y, w)
- integer(fgsl_int) function fgsl_filter_gaussian_kernel (alpha, order, normalize, kernel)
- type(fgsl_filter_median_workspace) function fgsl_filter_median_alloc (k)
- subroutine fgsl_filter_median_free (w)
- integer(fgsl_int) function fgsl_filter_median (endtype, alpha, order, x, y, w)
- type(fgsl_filter_rmedian_workspace) function fgsl_filter_rmedian_alloc (k)
- subroutine fgsl_filter_rmedian_free (w)
- integer(fgsl_int) function fgsl_filter_rmedian (endtype, alpha, order, x, y, w)
- type(fgsl_filter_impulse_workspace) function fgsl_filter_impulse_alloc (k)
- subroutine fgsl_filter_impulse_free (w)
- integer(fgsl_int) function fgsl_filter_impulse (endtype, scale_type, t, x, y, xmedian, xsigma, noutlier, ioutlier, w)

49.10.1 Function/Subroutine Documentation

49.10.1.1 fgsl_filter_gaussian()

```
integer(fgsl_int) function fgsl_filter_gaussian (
             integer(fgsl_int), intent(in) endtype,
             real(fgsl_double), intent(in) alpha,
             integer(fgsl_size_t), intent(in) order,
             type(fgsl_vector), intent(in) x,
             type(fgsl_vector), intent(inout) y,
             type(fgsl_filter_gaussian_workspace), intent(inout) w )
```

49.10.1.2 fgsl_filter_gaussian_alloc()

```
type(fgsl_filter_gaussian_workspace) function fgsl_filter_gaussian_alloc (
             integer(fgsl_size_t), intent(in) k )
```

49.10.1.3 fgsl_filter_gaussian_free()

```
subroutine fgsl_filter_gaussian_free (
             type(fgsl_filter_gaussian_workspace), intent(inout) w )
```

49.10.1.4 fgsl_filter_gaussian_kernel()

```
integer(fgsl_int) function fgsl_filter_gaussian_kernel (
             real(fgsl_double), intent(in) alpha,
             integer(fgsl_size_t), intent(in) order,
             integer(fgsl_int), intent(in) normalize,
             type(fgsl_vector), intent(inout) kernel )
```

49.10.1.5 fgsl_filter_impulse()

```
integer(fgsl_int) function fgsl_filter_impulse (
             integer(fgsl_int), intent(in) endtype,
             integer(fgsl_int), intent(in) scale_type,
             real(fgsl_double), intent(in) t,
             type(fgsl_vector), intent(in) x,
             type(fgsl_vector), intent(inout) y,
             type(fgsl_vector), intent(inout) xmedian,
             type(fgsl_vector), intent(inout) xsigma,
             integer(fgsl_size_t), intent(inout) noutlier,
             type(fgsl_vector_int), intent(inout) ioutlier,
             type(fgsl_filter_impulse_workspace), intent(inout) w )
```

49.10.1.6 fgsl_filter_impulse_alloc()

```
type(fgsl_filter_impulse_workspace) function fgsl_filter_impulse_alloc (
             integer(fgsl_size_t), intent(in) k )
```

49.10.1.7 fgsl_filter_impulse_free()

```
subroutine fgsl_filter_impulse_free (
             type(fgsl_filter_impulse_workspace), intent(inout) w )
```

49.10.1.8 fgsl_filter_median()

```
integer(fgsl_int) function fgsl_filter_median (
             integer(fgsl_int), intent(in) endtype,
             real(fgsl_double), intent(in) alpha,
             integer(fgsl_size_t), intent(in) order,
             type(fgsl_vector), intent(in) x,
             type(fgsl_vector), intent(inout) y,
             type(fgsl_filter_median_workspace), intent(inout) w )
```

49.10.1.9 fgsl_filter_median_alloc()

```
type(fgsl_filter_median_workspace) function fgsl_filter_median_alloc (
            integer(fgsl_size_t), intent(in) k )
```

49.10.1.10 fgsl_filter_median_free()

```
subroutine fgsl_filter_median_free (
            type(fgsl_filter_median_workspace), intent(inout) w )
```

49.10.1.11 fgsl_filter_rmedian()

```
integer(fgsl_int) function fgsl_filter_rmedian (
            integer(fgsl_int), intent(in) endtype,
            real(fgsl_double), intent(in) alpha,
            integer(fgsl_size_t), intent(in) order,
            type(fgsl_vector), intent(in) x,
            type(fgsl_vector), intent(inout) y,
            type(fgsl_filter_rmedian_workspace), intent(inout) w )
```

49.10.1.12 fgsl_filter_rmedian_alloc()

```
type(fgsl_filter_rmedian_workspace) function fgsl_filter_rmedian_alloc (
            integer(fgsl_size_t), intent(in) k )
```

49.10.1.13 fgsl_filter_rmedian_free()

```
subroutine fgsl_filter_rmedian_free (
            type(fgsl_filter_rmedian_workspace), intent(inout) w )
```

49.11 api/fit.finc File Reference

Functions/Subroutines

- integer(fgsl_int) function fgsl_fit_linear (x, xstride, y, ystride, n, c0, c1, cov00, cov01, cov11, sumsq)
- integer(fgsl_int) function fgsl_fit_wlinear (x, xstride, w, wstride, y, ystride, n, c0, c1, cov00, cov01, cov11, chisq)
- integer(fgsl_int) function fgsl_fit_linear_est (x, c0, c1, cov00, cov01, cov11, y, y_err)
- integer(fgsl_int) function fgsl_fit_mul (x, xstride, y, ystride, n, c1, cov11, sumsq)
- integer(fgsl_int) function fgsl_fit_wmul (x, xstride, w, wstride, y, ystride, n, c1, cov11, chisq)
- integer(fgsl_int) function fgsl_fit_mul_est (x, c1, cov11, y, y_err)

49.11.1 Function/Subroutine Documentation

49.11.1.1 fgsl_fit_linear()

```
integer(fgsl_int) function fgsl_fit_linear (
             real(fgsl_double), dimension(:), intent(in), target, contiguous x,
             integer(fgsl_size_t), intent(in) xstride,
             real(fgsl_double), dimension(:), intent(in), target, contiguous y,
             integer(fgsl_size_t), intent(in) ystride,
             integer(fgsl_size_t), intent(in) n,
             real(fgsl_double), intent(out) c0,
             real(fgsl_double), intent(out) c1,
             real(fgsl_double), intent(out) cov00,
             real(fgsl_double), intent(out) cov01,
             real(fgsl_double), intent(out) cov11,
             real(fgsl_double), intent(out) sumsq )
```

49.11.1.2 fgsl_fit_linear_est()

```
integer(fgsl_int) function fgsl_fit_linear_est (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) c0,
             real(fgsl_double), intent(in) c1,
             real(fgsl_double), intent(in) cov00,
             real(fgsl_double), intent(in) cov01,
             real(fgsl_double), intent(in) cov11,
             real(fgsl_double), intent(out) y,
             real(fgsl_double), intent(out) y_err )
```

49.11.1.3 fgsl_fit_mul()

```
integer(fgsl_int) function fgsl_fit_mul (
             real(fgsl_double), dimension(:), intent(in), target, contiguous x,
             integer(fgsl_size_t), intent(in) xstride,
             real(fgsl_double), dimension(:), intent(in), target, contiguous y,
             integer(fgsl_size_t), intent(in) ystride,
             integer(fgsl_size_t), intent(in) n,
             real(fgsl_double), intent(out) c1,
             real(fgsl_double), intent(out) cov11,
             real(fgsl_double), intent(out) sumsq )
```

49.11.1.4 fgsl_fit_mul_est()

```
integer(fgsl_int) function fgsl_fit_mul_est (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) c1,
             real(fgsl_double), intent(in) cov11,
             real(fgsl_double), intent(out) y,
             real(fgsl_double), intent(out) y_err )
```

49.11.1.5 fgsl_fit_wlinear()

```
integer(fgsl_int) function fgsl_fit_wlinear (
             real(fgsl_double), dimension(:), intent(in), target, contiguous x,
             integer(fgsl_size_t), intent(in) xstride,
             real(fgsl_double), dimension(:), intent(in), target, contiguous w,
             integer(fgsl_size_t), intent(in) wstride,
             real(fgsl_double), dimension(:), intent(in), target, contiguous y,
             integer(fgsl_size_t), intent(in) ystride,
             integer(fgsl_size_t), intent(in) n,
             real(fgsl_double), intent(out) c0,
             real(fgsl_double), intent(out) c1,
             real(fgsl_double), intent(out) cov00,
             real(fgsl_double), intent(out) cov01,
             real(fgsl_double), intent(out) cov11,
             real(fgsl_double), intent(out) chisq )
```

49.11.1.6 fgsl_fit_wmul()

```
integer(fgsl_int) function fgsl_fit_wmul (
             real(fgsl_double), dimension(:), intent(in), target, contiguous x,
             integer(fgsl_size_t), intent(in) xstride,
             real(fgsl_double), dimension(:), intent(in), target, contiguous w,
             integer(fgsl_size_t), intent(in) wstride,
             real(fgsl_double), dimension(:), intent(in), target, contiguous y,
             integer(fgsl_size_t), intent(in) ystride,
             integer(fgsl_size_t), intent(in) n,
             real(fgsl_double), intent(out) c1,
             real(fgsl_double), intent(out) cov11,
             real(fgsl_double), intent(out) chisq )
```

49.12 api/histogram.finc File Reference

Functions/Subroutines

- type(fgsl_histogram) function fgsl_histogram_alloc (n)
- integer(fgsl_int) function fgsl_histogram_set_ranges (h, range)
- integer(fgsl_int) function fgsl_histogram_set_ranges_uniform (h, xmin, xmax)

- subroutine fgsl_histogram_free (h)
- integer(fgsl_int) function fgsl_histogram_memcpy (dest, src)
- type(fgsl_histogram) function fgsl_histogram_clone (src)
- integer(fgsl_int) function fgsl_histogram_increment (h, x)
- integer(fgsl_int) function fgsl_histogram_accumulate (h, x, weight)
- real(fgsl_double) function fgsl_histogram_get (h, i)
- integer(fgsl_int) function fgsl_histogram_get_range (h, i, lower, upper)
- real(fgsl_double) function fgsl_histogram_max (h)
- real(fgsl_double) function fgsl_histogram_min (h)
- integer(fgsl_size_t) function fgsl_histogram_bins (h)
- subroutine fgsl_histogram_reset (h)
- integer(fgsl_int) function fgsl_histogram_find (h, x, i)
- real(fgsl_double) function fgsl_histogram_max_val (h)
- integer(fgsl_size_t) function fgsl_histogram_max_bin (h)
- real(fgsl_double) function fgsl_histogram_min_val (h)
- integer(fgsl_size_t) function fgsl_histogram_min_bin (h)
- real(fgsl_double) function fgsl_histogram_mean (h)
- real(fgsl_double) function fgsl_histogram_sigma (h)
- real(fgsl_double) function fgsl_histogram_sum (h)
- real(fgsl_double) function fgsl_histogram_equal_bins_p (h1, h2)
- real(fgsl_double) function fgsl_histogram_add (h1, h2)
- real(fgsl_double) function fgsl_histogram_sub (h1, h2)
- real(fgsl_double) function fgsl_histogram_mul (h1, h2)
- real(fgsl_double) function fgsl_histogram_div (h1, h2)
- integer(fgsl_int) function fgsl_histogram_scale (h, scale)
- integer(fgsl_int) function fgsl_histogram_shift (h, offset)
- integer(fgsl_int) function fgsl_histogram_fwrite (stream, h)
- integer(fgsl_int) function fgsl_histogram_fread (stream, h)
- integer(fgsl_int) function fgsl_histogram_fprintf (stream, h, range_format, bin_format)
- integer(fgsl_int) function fgsl_histogram_fscanf (stream, h)
- type(fgsl_histogram_pdf) function fgsl_histogram_pdf_alloc (n)
- integer(fgsl_int) function fgsl_histogram_pdf_init (p, h)
- subroutine fgsl_histogram_pdf_free (p)
- real(fgsl_double) function fgsl_histogram_pdf_sample (p, r)
- type(fgsl_histogram2d) function fgsl_histogram2d_alloc (nx, ny)
- integer(fgsl_int) function fgsl_histogram2d_set_ranges (h, xrange, yrange)
- integer(fgsl_int) function fgsl_histogram2d_set_ranges_uniform (h, xmin, xmax, ymin, ymax)
- subroutine fgsl_histogram2d_free (h)
- integer(fgsl_int) function fgsl_histogram2d_memcpy (dest, src)
- type(fgsl_histogram2d) function fgsl_histogram2d_clone (src)
- integer(fgsl_int) function fgsl_histogram2d_increment (h, x, y)
- integer(fgsl_int) function fgsl_histogram2d_accumulate (h, x, y, weight)
- real(fgsl_double) function fgsl_histogram2d_get (h, i, j)
- integer(fgsl_int) function fgsl_histogram2d_get_xrange (h, i, xlower, xupper)
- integer(fgsl_int) function fgsl_histogram2d_get_yrange (h, i, ylower, yupper)
- real(fgsl_double) function fgsl_histogram2d_xmax (h)
- real(fgsl_double) function fgsl_histogram2d_xmin (h)
- integer(fgsl_size_t) function fgsl_histogram2d_nx (h)
- real(fgsl_double) function fgsl_histogram2d_ymax (h)
- real(fgsl_double) function fgsl_histogram2d_ymin (h)
- integer(fgsl_size_t) function fgsl_histogram2d_ny (h)
- subroutine fgsl_histogram2d_reset (h)
- integer(fgsl_int) function fgsl_histogram2d_find (h, x, y, i, j)
- real(fgsl_double) function fgsl_histogram2d_max_val (h)
- subroutine fgsl_histogram2d_max_bin (h, i, j)

- real(fgsl_double) function fgsl_histogram2d_min_val (h)
- subroutine fgsl_histogram2d_min_bin (h, i, j)
- real(fgsl_double) function fgsl_histogram2d_xmean (h)
- real(fgsl_double) function fgsl_histogram2d_ymean (h)
- real(fgsl_double) function fgsl_histogram2d_xsigma (h)
- real(fgsl_double) function fgsl_histogram2d_ysigma (h)
- real(fgsl_double) function fgsl_histogram2d_cov (h)
- real(fgsl_double) function fgsl_histogram2d_sum (h)
- real(fgsl_double) function fgsl_histogram2d_equal_bins_p (h1, h2)
- real(fgsl_double) function fgsl_histogram2d_add (h1, h2)
- real(fgsl_double) function fgsl_histogram2d_sub (h1, h2)
- real(fgsl_double) function fgsl_histogram2d_mul (h1, h2)
- real(fgsl_double) function fgsl_histogram2d_div (h1, h2)
- integer(fgsl_int) function fgsl_histogram2d_scale (h, scale)
- integer(fgsl_int) function fgsl_histogram2d_shift (h, offset)
- integer(fgsl_int) function fgsl_histogram2d_fwrite (stream, h)
- integer(fgsl_int) function fgsl_histogram2d_fread (stream, h)
- integer(fgsl_int) function fgsl_histogram2d_fprintf (stream, h, range_format, bin_format)
- integer(fgsl_int) function fgsl_histogram2d_fscanf (stream, h)
- type(fgsl_histogram2d_pdf) function fgsl_histogram2d_pdf_alloc (nx, ny)
- integer(fgsl_int) function fgsl_histogram2d_pdf_init (p, h)
- subroutine fgsl_histogram2d_pdf_free (p)
- integer(fgsl_int) function fgsl_histogram2d_pdf_sample (p, r1, r2, x, y)
- logical function fgsl_histogram_status (histogram)

49.12.1 Function/Subroutine Documentation

49.12.1.1 fgsl_histogram2d_accumulate()

```
integer(fgsl_int) function fgsl_histogram2d_accumulate (
             type(fgsl_histogram2d), intent(inout) h,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             real(fgsl_double), intent(in) weight )
```

49.12.1.2 fgsl_histogram2d_add()

```
real(fgsl_double) function fgsl_histogram2d_add (
             type(fgsl_histogram2d), intent(inout) h1,
             type(fgsl_histogram2d), intent(in) h2 )
```

49.12.1.3 fgsl_histogram2d_alloc()

```
type(fgsl_histogram2d) function fgsl_histogram2d_alloc (
             integer(fgsl_size_t), intent(in) nx,
             integer(fgsl_size_t), intent(in) ny )
```

49.12.1.4 fgsl_histogram2d_clone()

```
type(fgsl_histogram2d) function fgsl_histogram2d_clone (
             type(fgsl_histogram2d), intent(in) src )
```

49.12.1.5 fgsl_histogram2d_cov()

```
real(fgsl_double) function fgsl_histogram2d_cov (
             type(fgsl_histogram2d), intent(in) h )
```

49.12.1.6 fgsl_histogram2d_div()

```
real(fgsl_double) function fgsl_histogram2d_div (
             type(fgsl_histogram2d), intent(inout) h1,
             type(fgsl_histogram2d), intent(in) h2 )
```

49.12.1.7 fgsl_histogram2d_equal_bins_p()

```
real(fgsl_double) function fgsl_histogram2d_equal_bins_p (
             type(fgsl_histogram2d), intent(in) h1,
             type(fgsl_histogram2d), intent(in) h2 )
```

49.12.1.8 fgsl_histogram2d_find()

```
integer(fgsl_int) function fgsl_histogram2d_find (
             type(fgsl_histogram2d), intent(in) h,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             integer(fgsl_size_t), intent(out) i,
             integer(fgsl_size_t), intent(out) j )
```

49.12.1.9 fgsl_histogram2d_fprintf()

```
integer(fgsl_int) function fgsl_histogram2d_fprintf (
             type(fgsl_file), intent(in) stream,
             type(fgsl_histogram2d), intent(in) h,
             character(kind=fgsl_char, len=*), intent(in) range_format,
             character(kind=fgsl_char, len=*), intent(in) bin_format )
```

49.12.1.10 fgsl_histogram2d_fread()

```
integer(fgsl_int) function fgsl_histogram2d_fread (
             type(fgsl_file), intent(in) stream,
             type(fgsl_histogram2d), intent(inout) h )
```

49.12.1.11 fgsl_histogram2d_free()

```
subroutine fgsl_histogram2d_free (
             type(fgsl_histogram2d), intent(inout) h )
```

49.12.1.12 fgsl_histogram2d_fscanf()

```
integer(fgsl_int) function fgsl_histogram2d_fscanf (
             type(fgsl_file), intent(in) stream,
             type(fgsl_histogram2d), intent(inout) h )
```

49.12.1.13 fgsl_histogram2d_fwrite()

```
integer(fgsl_int) function fgsl_histogram2d_fwrite (
             type(fgsl_file), intent(in) stream,
             type(fgsl_histogram2d), intent(in) h )
```

49.12.1.14 fgsl_histogram2d_get()

```
real(fgsl_double) function fgsl_histogram2d_get (
             type(fgsl_histogram2d), intent(in) h,
             integer(fgsl_size_t), intent(in) i,
             integer(fgsl_size_t), intent(in) j )
```

49.12.1.15 fgsl_histogram2d_get_xrange()

```
integer(fgsl_int) function fgsl_histogram2d_get_xrange (
             type(fgsl_histogram2d), intent(in) h,
             integer(fgsl_size_t), intent(in) i,
             real(fgsl_double), intent(out) xlower,
             real(fgsl_double), intent(out) xupper )
```

49.12.1.16 fgsl_histogram2d_get_yrange()

```
integer(fgsl_int) function fgsl_histogram2d_get_yrange (
             type(fgsl_histogram2d), intent(in) h,
             integer(fgsl_size_t), intent(in) i,
             real(fgsl_double), intent(out) ylower,
             real(fgsl_double), intent(out) yupper )
```

49.12.1.17 fgsl_histogram2d_increment()

```
integer(fgsl_int) function fgsl_histogram2d_increment (
             type(fgsl_histogram2d), intent(inout) h,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y )
```

49.12.1.18 fgsl_histogram2d_max_bin()

```
subroutine fgsl_histogram2d_max_bin (
             type(fgsl_histogram2d), intent(in) h,
             integer(fgsl_size_t), intent(out) i,
             integer(fgsl_size_t), intent(out) j )
```

49.12.1.19 fgsl_histogram2d_max_val()

```
real(fgsl_double) function fgsl_histogram2d_max_val (
             type(fgsl_histogram2d), intent(in) h )
```

49.12.1.20 fgsl_histogram2d_memcpy()

```
integer(fgsl_int) function fgsl_histogram2d_memcpy (
             type(fgsl_histogram2d), intent(inout) dest,
             type(fgsl_histogram2d), intent(in) src )
```

49.12.1.21 fgsl_histogram2d_min_bin()

```
subroutine fgsl_histogram2d_min_bin (
             type(fgsl_histogram2d), intent(in) h,
             integer(fgsl_size_t), intent(out) i,
             integer(fgsl_size_t), intent(out) j )
```

49.12.1.22 fgsl_histogram2d_min_val()

```
real(fgsl_double) function fgsl_histogram2d_min_val (
             type(fgsl_histogram2d), intent(in) h )
```

49.12.1.23 fgsl_histogram2d_mul()

```
real(fgsl_double) function fgsl_histogram2d_mul (
             type(fgsl_histogram2d), intent(inout) h1,
             type(fgsl_histogram2d), intent(in) h2 )
```

49.12.1.24 fgsl_histogram2d_nx()

```
integer(fgsl_size_t) function fgsl_histogram2d_nx (
             type(fgsl_histogram2d), intent(in) h )
```

49.12.1.25 fgsl_histogram2d_ny()

```
integer(fgsl_size_t) function fgsl_histogram2d_ny (
             type(fgsl_histogram2d), intent(in) h )
```

49.12.1.26 fgsl_histogram2d_pdf_alloc()

```
type(fgsl_histogram2d_pdf) function fgsl_histogram2d_pdf_alloc (
             integer(fgsl_size_t), intent(in) nx,
             integer(fgsl_size_t), intent(in) ny )
```

49.12.1.27 fgsl_histogram2d_pdf_free()

```
subroutine fgsl_histogram2d_pdf_free (
             type(fgsl_histogram2d_pdf), intent(inout) p )
```

49.12.1.28 fgsl_histogram2d_pdf_init()

```
integer(fgsl_int) function fgsl_histogram2d_pdf_init (
             type(fgsl_histogram2d_pdf), intent(inout) p,
             type(fgsl_histogram2d), intent(in) h )
```

49.12.1.29 fgsl_histogram2d_pdf_sample()

```
integer(fgsl_int) function fgsl_histogram2d_pdf_sample (
             type(fgsl_histogram2d_pdf), intent(in) p,
             real(fgsl_double), intent(in) r1,
             real(fgsl_double), intent(in) r2,
             real(fgsl_double), intent(out) x,
             real(fgsl_double), intent(out) y )
```

49.12.1.30 fgsl_histogram2d_reset()

```
subroutine fgsl_histogram2d_reset (
             type(fgsl_histogram2d), intent(inout) h )
```

49.12.1.31 fgsl_histogram2d_scale()

```
integer(fgsl_int) function fgsl_histogram2d_scale (
             type(fgsl_histogram2d), intent(inout) h,
             real(fgsl_double), intent(in) scale )
```

49.12.1.32 fgsl_histogram2d_set_ranges()

```
integer(fgsl_int) function fgsl_histogram2d_set_ranges (
             type(fgsl_histogram2d), intent(inout) h,
             real(fgsl_double), dimension(:), intent(in), target, contiguous xrange,
             real(fgsl_double), dimension(:), intent(in), target, contiguous yrange )
```

49.12.1.33 fgsl_histogram2d_set_ranges_uniform()

```
integer(fgsl_int) function fgsl_histogram2d_set_ranges_uniform (
             type(fgsl_histogram2d), intent(inout) h,
             real(fgsl_double), intent(in) xmin,
             real(fgsl_double), intent(in) xmax,
             real(fgsl_double), intent(in) ymin,
             real(fgsl_double), intent(in) ymax )
```

49.12.1.34 fgsl_histogram2d_shift()

```
integer(fgsl_int) function fgsl_histogram2d_shift (
             type(fgsl_histogram2d), intent(inout) h,
             real(fgsl_double), intent(in) offset )
```

49.12.1.35 fgsl_histogram2d_sub()

```
real(fgsl_double) function fgsl_histogram2d_sub (
             type(fgsl_histogram2d), intent(inout) h1,
             type(fgsl_histogram2d), intent(in) h2 )
```

49.12.1.36 fgsl_histogram2d_sum()

```
real(fgsl_double) function fgsl_histogram2d_sum (
             type(fgsl_histogram2d), intent(in) h )
```

49.12.1.37 fgsl_histogram2d_xmax()

```
real(fgsl_double) function fgsl_histogram2d_xmax (
             type(fgsl_histogram2d), intent(in) h )
```

49.12.1.38 fgsl_histogram2d_xmean()

```
real(fgsl_double) function fgsl_histogram2d_xmean (
             type(fgsl_histogram2d), intent(in) h )
```

49.12.1.39 fgsl_histogram2d_xmin()

```
real(fgsl_double) function fgsl_histogram2d_xmin (
             type(fgsl_histogram2d), intent(in) h )
```

49.12.1.40 fgsl_histogram2d_xsigma()

```
real(fgsl_double) function fgsl_histogram2d_xsigma (
             type(fgsl_histogram2d), intent(in) h )
```

49.12.1.41 fgsl_histogram2d_ymax()

```
real(fgsl_double) function fgsl_histogram2d_ymax (
             type(fgsl_histogram2d), intent(in) h )
```

49.12.1.42 fgsl_histogram2d_ymean()

```
real(fgsl_double) function fgsl_histogram2d_ymean (
             type(fgsl_histogram2d), intent(in) h )
```

49.12.1.43 fgsl_histogram2d_ymin()

```
real(fgsl_double) function fgsl_histogram2d_ymin (
             type(fgsl_histogram2d), intent(in) h )
```

49.12.1.44 fgsl_histogram2d_ysigma()

```
real(fgsl_double) function fgsl_histogram2d_ysigma (
             type(fgsl_histogram2d), intent(in) h )
```

49.12.1.45 fgsl_histogram_accumulate()

```
integer(fgsl_int) function fgsl_histogram_accumulate (
             type(fgsl_histogram), intent(inout) h,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) weight )
```

49.12.1.46 fgsl_histogram_add()

```
real(fgsl_double) function fgsl_histogram_add (
             type(fgsl_histogram), intent(inout) h1,
             type(fgsl_histogram), intent(in) h2 )
```

49.12.1.47 fgsl_histogram_alloc()

```
type(fgsl_histogram) function fgsl_histogram_alloc (
             integer(fgsl_size_t), intent(in) n )
```

49.12.1.48 fgsl_histogram_bins()

```
integer(fgsl_size_t) function fgsl_histogram_bins (
             type(fgsl_histogram), intent(in) h )
```

49.12.1.49 fgsl_histogram_clone()

```
type(fgsl_histogram) function fgsl_histogram_clone (
             type(fgsl_histogram), intent(in) src )
```

49.12.1.50 fgsl_histogram_div()

```
real(fgsl_double) function fgsl_histogram_div (
             type(fgsl_histogram), intent(inout) h1,
             type(fgsl_histogram), intent(in) h2 )
```

49.12.1.51 fgsl_histogram_equal_bins_p()

```
real(fgsl_double) function fgsl_histogram_equal_bins_p (
             type(fgsl_histogram), intent(in) h1,
             type(fgsl_histogram), intent(in) h2 )
```

49.12.1.52 fgsl_histogram_find()

```
integer(fgsl_int) function fgsl_histogram_find (
             type(fgsl_histogram), intent(in) h,
             real(fgsl_double), intent(in) x,
             integer(fgsl_size_t), intent(out) i )
```

49.12.1.53 fgsl_histogram_fprintf()

```
integer(fgsl_int) function fgsl_histogram_fprintf (
             type(fgsl_file), intent(in) stream,
             type(fgsl_histogram), intent(in) h,
             character(kind=fgsl_char, len=*), intent(in) range_format,
             character(kind=fgsl_char, len=*), intent(in) bin_format )
```

49.12.1.54 fgsl_histogram_fread()

```
integer(fgsl_int) function fgsl_histogram_fread (
             type(fgsl_file), intent(in) stream,
             type(fgsl_histogram), intent(inout) h )
```

49.12.1.55 fgsl_histogram_free()

```
subroutine fgsl_histogram_free (
             type(fgsl_histogram), intent(inout) h )
```

49.12.1.56 fgsl_histogram_fscanf()

```
integer(fgsl_int) function fgsl_histogram_fscanf (
             type(fgsl_file), intent(in) stream,
             type(fgsl_histogram), intent(inout) h )
```

49.12.1.57 fgsl_histogram_fwrite()

```
integer(fgsl_int) function fgsl_histogram_fwrite (
             type(fgsl_file), intent(in) stream,
             type(fgsl_histogram), intent(in) h )
```

49.12.1.58 fgsl_histogram_get()

```
real(fgsl_double) function fgsl_histogram_get (
             type(fgsl_histogram), intent(in) h,
             integer(fgsl_size_t), intent(in) i )
```

49.12.1.59 fgsl_histogram_get_range()

```
integer(fgsl_int) function fgsl_histogram_get_range (
             type(fgsl_histogram), intent(in) h,
             integer(fgsl_size_t), intent(in) i,
             real(fgsl_double), intent(out) lower,
             real(fgsl_double), intent(out) upper )
```

49.12.1.60 fgsl_histogram_increment()

```
integer(fgsl_int) function fgsl_histogram_increment (
             type(fgsl_histogram), intent(inout) h,
             real(fgsl_double), intent(in) x )
```

49.12.1.61 fgsl_histogram_max()

```
real(fgsl_double) function fgsl_histogram_max (
             type(fgsl_histogram), intent(in) h )
```

49.12.1.62 fgsl_histogram_max_bin()

```
integer(fgsl_size_t) function fgsl_histogram_max_bin (
             type(fgsl_histogram), intent(in) h )
```

49.12.1.63 fgsl_histogram_max_val()

```
real(fgsl_double) function fgsl_histogram_max_val (
             type(fgsl_histogram), intent(in) h )
```

49.12.1.64 fgsl_histogram_mean()

```
real(fgsl_double) function fgsl_histogram_mean (
            type(fgsl_histogram), intent(in) h )
```

49.12.1.65 fgsl_histogram_memcpy()

```
integer(fgsl_int) function fgsl_histogram_memcpy (
            type(fgsl_histogram), intent(inout) dest,
            type(fgsl_histogram), intent(in) src )
```

49.12.1.66 fgsl_histogram_min()

```
real(fgsl_double) function fgsl_histogram_min (
            type(fgsl_histogram), intent(in) h )
```

49.12.1.67 fgsl_histogram_min_bin()

```
integer(fgsl_size_t) function fgsl_histogram_min_bin (
            type(fgsl_histogram), intent(in) h )
```

49.12.1.68 fgsl_histogram_min_val()

```
real(fgsl_double) function fgsl_histogram_min_val (
            type(fgsl_histogram), intent(in) h )
```

49.12.1.69 fgsl_histogram_mul()

```
real(fgsl_double) function fgsl_histogram_mul (
            type(fgsl_histogram), intent(inout) h1,
            type(fgsl_histogram), intent(in) h2 )
```

49.12.1.70 fgsl_histogram_pdf_alloc()

```
type(fgsl_histogram_pdf) function fgsl_histogram_pdf_alloc (
            integer(fgsl_size_t), intent(in) n )
```

49.12.1.71 fgsl_histogram_pdf_free()

```
subroutine fgsl_histogram_pdf_free (
             type(fgsl_histogram_pdf), intent(inout) p )
```

49.12.1.72 fgsl_histogram_pdf_init()

```
integer(fgsl_int) function fgsl_histogram_pdf_init (
             type(fgsl_histogram_pdf), intent(inout) p,
             type(fgsl_histogram), intent(in) h )
```

49.12.1.73 fgsl_histogram_pdf_sample()

```
real(fgsl_double) function fgsl_histogram_pdf_sample (
             type(fgsl_histogram_pdf), intent(in) p,
             real(fgsl_double), intent(in) r )
```

49.12.1.74 fgsl_histogram_reset()

```
subroutine fgsl_histogram_reset (
             type(fgsl_histogram), intent(inout) h )
```

49.12.1.75 fgsl_histogram_scale()

```
integer(fgsl_int) function fgsl_histogram_scale (
             type(fgsl_histogram), intent(inout) h,
             real(fgsl_double), intent(in) scale )
```

49.12.1.76 fgsl_histogram_set_ranges()

```
integer(fgsl_int) function fgsl_histogram_set_ranges (
             type(fgsl_histogram), intent(inout) h,
             real(fgsl_double), dimension(:), intent(in), target, contiguous range )
```

49.12.1.77 fgsl_histogram_set_ranges_uniform()

```
integer(fgsl_int) function fgsl_histogram_set_ranges_uniform (
             type(fgsl_histogram), intent(inout) h,
             real(fgsl_double), intent(in) xmin,
             real(fgsl_double), intent(in) xmax )
```

49.12.1.78 fgsl_histogram_shift()

```
integer(fgsl_int) function fgsl_histogram_shift (
             type(fgsl_histogram), intent(inout) h,
             real(fgsl_double), intent(in) offset )
```

49.12.1.79 fgsl_histogram_sigma()

```
real(fgsl_double) function fgsl_histogram_sigma (
             type(fgsl_histogram), intent(in) h )
```

49.12.1.80 fgsl_histogram_status()

```
logical function fgsl_histogram_status (
             type(fgsl_histogram), intent(in) histogram )
```

49.12.1.81 fgsl_histogram_sub()

```
real(fgsl_double) function fgsl_histogram_sub (
             type(fgsl_histogram), intent(inout) h1,
             type(fgsl_histogram), intent(in) h2 )
```

49.12.1.82 fgsl_histogram_sum()

```
real(fgsl_double) function fgsl_histogram_sum (
             type(fgsl_histogram), intent(in) h )
```

49.13 api/ieee.finc File Reference

Functions/Subroutines

- subroutine fgsl_ieee_fprintf_float (stream, x)
- subroutine fgsl_ieee_fprintf_double (stream, x)
- subroutine fgsl_ieee_printf_float (x)
- subroutine fgsl_ieee_printf_double (x)
- subroutine fgsl_ieee_env_setup ()

49.13.1 Function/Subroutine Documentation

49.13.1.1 fgsl_ieee_env_setup()

```
subroutine fgsl_ieee_env_setup
```

49.13.1.2 fgsl_ieee_fprintf_double()

```
subroutine fgsl_ieee_fprintf_double (
             type(fgsl_file), intent(in) stream,
             real(fgsl_double) x )
```

49.13.1.3 fgsl_ieee_fprintf_float()

```
subroutine fgsl_ieee_fprintf_float (
             type(fgsl_file), intent(in) stream,
             real(fgsl_float) x )
```

49.13.1.4 fgsl_ieee_printf_double()

```
subroutine fgsl_ieee_printf_double (
             real(fgsl_double) x )
```

49.13.1.5 fgsl_ieee_printf_float()

```
subroutine fgsl_ieee_printf_float (
             real(fgsl_float) x )
```

49.14 api/integration.finc File Reference

Functions/Subroutines

- integer(fgsl_int) function fgsl_integration_qng (f, a, b, epsabs, epsrel, result, abserr, neval)
- type(fgsl_integration_workspace) function fgsl_integration_workspace_alloc (n)
- subroutine fgsl_integration_workspace_free (w)
- integer(fgsl_int) function fgsl_integration_qag (f, a, b, epsabs, epsrel, limit, key, workspace, result, abserr)
- integer(fgsl_int) function fgsl_integration_qags (f, a, b, epsabs, epsrel, limit, workspace, result, abserr)
- integer(fgsl_int) function fgsl_integration_qagp (f, pts, epsabs, epsrel, limit, workspace, result, abserr)
- integer(fgsl_int) function fgsl_integration_qagi (f, epsabs, epsrel, limit, workspace, result, abserr)
- integer(fgsl_int) function fgsl_integration_qagiu (f, a, epsabs, epsrel, limit, workspace, result, abserr)
- integer(fgsl_int) function fgsl_integration_qagil (f, b, epsabs, epsrel, limit, workspace, result, abserr)
- integer(fgsl_int) function fgsl_integration_qawc (f, a, b, c, epsabs, epsrel, limit, workspace, result, abserr)
- type(fgsl_integration_qaws_table) function fgsl_integration_qaws_table_alloc (alpha, beta, mu, nu)
- integer(c_int) function fgsl_integration_qaws_table_set (t, alpha, beta, mu, nu)
- subroutine fgsl_integration_qaws_table_free (w)
- integer(fgsl_int) function fgsl_integration_qaws (f, a, b, t, epsabs, epsrel, limit, workspace, result, abserr)
- type(fgsl_integration_qawo_table) function fgsl_integration_qawo_table_alloc (omega, l, sine, n)
- integer(fgsl_int) function fgsl_integration_qawo_table_set (t, omega, l, sine)
- integer(fgsl_int) function fgsl_integration_qawo_table_set_length (t, l)
- subroutine fgsl_integration_qawo_table_free (w)
- integer(fgsl_int) function fgsl_integration_qawo (f, a, epsabs, epsrel, limit, workspace, wf, result, abserr)
- integer(fgsl_int) function fgsl_integration_qawf (f, a, epsabs, limit, workspace, cyc_workspace, wf, result, abserr)
- type(fgsl_integration_cquad_workspace) function fgsl_integration_cquad_workspace_alloc (n)
- subroutine fgsl_integration_cquad_workspace_free (w)
- integer(fgsl_int) function fgsl_integration_cquad (f, a, b, epsabs, epsrel, workspace, result, abserr, nevals)
- type(fgsl_integration_romberg_workspace) function fgsl_integration_romberg_alloc (n)
- subroutine fgsl_integration_romberg_free (w)
- integer(fgsl_int) function fgsl_integration_romberg (f, a, b, epsabs, epsrel, result, neval, w)
- type(fgsl_integration_glfixed_table) function fgsl_integration_glfixed_table_alloc (n)
- subroutine fgsl_integration_glfixed_table_free (t)
- real(fgsl_double) function fgsl_integration_glfixed (f, a, b, t)
- integer(fgsl_int) function fgsl_integration_glfixed_point (a, b, i, xi, wi, t)
- type(fgsl_integration_fixed_workspace) function fgsl_integration_fixed_alloc (t, n, a, b, alpha, beta)
- subroutine fgsl_integration_fixed_free (w)
- integer(fgsl_size_t) function fgsl_integration_fixed_n (w)
- real(fgsl_double) function, dimension(:), pointer fgsl_integration_fixed_nodes (w)
- real(fgsl_double) function, dimension(:), pointer fgsl_integration_fixed_weights (w)
- integer(fgsl_int) function fgsl_integration_fixed (func, result, w)
- logical function fgsl_integration_workspace_status (integration_workspace)
- logical function fgsl_integration_qaws_table_status (integration_qaws_table)
- logical function fgsl_integration_qawo_table_status (integration_qawo_table)
- logical function fgsl_integration_cquad_workspace_status (integration_workspace)
- logical function fgsl_integration_glfixed_table_status (integration_glfixed_table)
- integer(fgsl_size_t) function fgsl_sizeof_integration_workspace (w)
- integer(fgsl_size_t) function fgsl_sizeof_integration_qaws_table (w)
- integer(fgsl_size_t) function fgsl_sizeof_integration_qawo_table (w)

49.14.1 Function/Subroutine Documentation

49.14.1.1 fgsl_integration_cquad()

```
integer(fgsl_int) function fgsl_integration_cquad (
            type(fgsl_function), intent(in) f,
            real(fgsl_double), intent(in) a,
            real(fgsl_double), intent(in) b,
            real(fgsl_double), intent(in) epsabs,
            real(fgsl_double), intent(in) epsrel,
            type(fgsl_integration_cquad_workspace), intent(inout) workspace,
            real(fgsl_double), intent(out) result,
            real(fgsl_double), intent(out) abserr,
            integer(fgsl_size_t), intent(inout) nevals )
```

49.14.1.2 fgsl_integration_cquad_workspace_alloc()

```
type(fgsl_integration_cquad_workspace) function fgsl_integration_cquad_workspace_alloc (
            integer(fgsl_size_t), intent(in) n )
```

49.14.1.3 fgsl_integration_cquad_workspace_free()

```
subroutine fgsl_integration_cquad_workspace_free (
            type(fgsl_integration_cquad_workspace), intent(inout) w )
```

49.14.1.4 fgsl_integration_cquad_workspace_status()

```
logical function fgsl_integration_cquad_workspace_status (
            type(fgsl_integration_cquad_workspace), intent(in) integration_workspace )
```

49.14.1.5 fgsl_integration_fixed()

```
integer(fgsl_int) function fgsl_integration_fixed (
            type(fgsl_function), intent(inout) func,
            real(fgsl_double), target result,
            type(fgsl_integration_fixed_workspace), intent(in) w )
```

49.14.1.6 fgsl_integration_fixed_alloc()

```
type(fgsl_integration_fixed_workspace) function fgsl_integration_fixed_alloc (
             integer(fgsl_int), intent(in) t,
             integer(fgsl_size_t), intent(in) n,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b,
             real(fgsl_double), intent(in) alpha,
             real(fgsl_double), intent(in) beta )
```

49.14.1.7 fgsl_integration_fixed_free()

```
subroutine fgsl_integration_fixed_free (
             type(fgsl_integration_fixed_workspace), intent(inout) w )
```

49.14.1.8 fgsl_integration_fixed_n()

```
integer(fgsl_size_t) function fgsl_integration_fixed_n (
             type(fgsl_integration_fixed_workspace), intent(in) w )
```

49.14.1.9 fgsl_integration_fixed_nodes()

```
real(fgsl_double) function, dimension(:), pointer fgsl_integration_fixed_nodes (
             type(fgsl_integration_fixed_workspace), intent(in) w )
```

49.14.1.10 fgsl_integration_fixed_weights()

```
real(fgsl_double) function, dimension(:), pointer fgsl_integration_fixed_weights (
             type(fgsl_integration_fixed_workspace), intent(in) w )
```

49.14.1.11 fgsl_integration_glfixed()

```
real(fgsl_double) function fgsl_integration_glfixed (
             type(fgsl_function), intent(in) f,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b,
             type(fgsl_integration_glfixed_table), intent(in) t )
```

49.14.1.12 fgsl_integration_glfixed_point()

```
integer(fgsl_int) function fgsl_integration_glfixed_point (
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b,
             integer(fgsl_size_t), intent(in) i,
             real(fgsl_double), intent(inout) xi,
             real(fgsl_double), intent(inout) wi,
             type(fgsl_integration_glfixed_table), intent(in) t )
```

49.14.1.13 fgsl_integration_glfixed_table_alloc()

```
type(fgsl_integration_glfixed_table) function fgsl_integration_glfixed_table_alloc (
             integer(fgsl_size_t), intent(in) n )
```

49.14.1.14 fgsl_integration_glfixed_table_free()

```
subroutine fgsl_integration_glfixed_table_free (
             type(fgsl_integration_glfixed_table) t )
```

49.14.1.15 fgsl_integration_glfixed_table_status()

```
logical function fgsl_integration_glfixed_table_status (
             type(fgsl_integration_glfixed_table), intent(in) integration_glfixed_table )
```

49.14.1.16 fgsl_integration_qag()

```
integer(fgsl_int) function fgsl_integration_qag (
             type(fgsl_function), intent(in) f,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b,
             real(fgsl_double), intent(in) epsabs,
             real(fgsl_double), intent(in) epsrel,
             integer(fgsl_size_t), intent(in) limit,
             integer(fgsl_int), intent(in) key,
             type(fgsl_integration_workspace), intent(inout) workspace,
             real(fgsl_double), intent(out) result,
             real(fgsl_double), intent(out) abserr )
```

49.14.1.17 fgsl_integration_qagi()

```
integer(fgsl_int) function fgsl_integration_qagi (
             type(fgsl_function), intent(in) f,
             real(fgsl_double), intent(in) epsabs,
             real(fgsl_double), intent(in) epsrel,
             integer(fgsl_size_t), intent(in) limit,
             type(fgsl_integration_workspace), intent(inout) workspace,
             real(fgsl_double), intent(out) result,
             real(fgsl_double), intent(out) abserr )
```

49.14.1.18 fgsl_integration_qagil()

```
integer(fgsl_int) function fgsl_integration_qagil (
             type(fgsl_function), intent(in) f,
             real(fgsl_double), intent(in) b,
             real(fgsl_double), intent(in) epsabs,
             real(fgsl_double), intent(in) epsrel,
             integer(fgsl_size_t), intent(in) limit,
             type(fgsl_integration_workspace), intent(inout) workspace,
             real(fgsl_double), intent(out) result,
             real(fgsl_double), intent(out) abserr )
```

49.14.1.19 fgsl_integration_qagiu()

```
integer(fgsl_int) function fgsl_integration_qagiu (
             type(fgsl_function), intent(in) f,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) epsabs,
             real(fgsl_double), intent(in) epsrel,
             integer(fgsl_size_t), intent(in) limit,
             type(fgsl_integration_workspace), intent(inout) workspace,
             real(fgsl_double), intent(out) result,
             real(fgsl_double), intent(out) abserr )
```

49.14.1.20 fgsl_integration_qagp()

```
integer(fgsl_int) function fgsl_integration_qagp (
             type(fgsl_function), intent(in) f,
             real(fgsl_double), dimension(:), intent(in), target, contiguous pts,
             real(fgsl_double), intent(in) epsabs,
             real(fgsl_double), intent(in) epsrel,
             integer(fgsl_size_t), intent(in) limit,
             type(fgsl_integration_workspace), intent(inout) workspace,
             real(fgsl_double), intent(out) result,
             real(fgsl_double), intent(out) abserr )
```

49.14.1.21 fgsl_integration_qags()

```
integer(fgsl_int) function fgsl_integration_qags (
             type(fgsl_function), intent(in) f,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b,
             real(fgsl_double), intent(in) epsabs,
             real(fgsl_double), intent(in) epsrel,
             integer(fgsl_size_t), intent(in) limit,
             type(fgsl_integration_workspace), intent(inout) workspace,
             real(fgsl_double), intent(out) result,
             real(fgsl_double), intent(out) abserr )
```

49.14.1.22 fgsl_integration_qawc()

```
integer(fgsl_int) function fgsl_integration_qawc (
             type(fgsl_function), intent(in) f,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b,
             real(fgsl_double), intent(in) c,
             real(fgsl_double), intent(in) epsabs,
             real(fgsl_double), intent(in) epsrel,
             integer(fgsl_size_t), intent(in) limit,
             type(fgsl_integration_workspace), intent(inout) workspace,
             real(fgsl_double), intent(out) result,
             real(fgsl_double), intent(out) abserr )
```

49.14.1.23 fgsl_integration_qawf()

```
integer(fgsl_int) function fgsl_integration_qawf (
             type(fgsl_function), intent(in) f,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) epsabs,
             integer(fgsl_size_t), intent(in) limit,
             type(fgsl_integration_workspace), intent(inout) workspace,
             type(fgsl_integration_workspace), intent(inout) cyc_workspace,
             type(fgsl_integration_qawo_table), intent(in) wf,
             real(fgsl_double), intent(out) result,
             real(fgsl_double), intent(out) abserr )
```

49.14.1.24 fgsl_integration_qawo()

```
integer(fgsl_int) function fgsl_integration_qawo (
             type(fgsl_function), intent(in) f,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) epsabs,
             real(fgsl_double), intent(in) epsrel,
             integer(fgsl_size_t), intent(in) limit,
             type(fgsl_integration_workspace), intent(inout) workspace,
             type(fgsl_integration_qawo_table), intent(in) wf,
             real(fgsl_double), intent(out) result,
             real(fgsl_double), intent(out) abserr )
```

49.14.1.25 fgsl_integration_qawo_table_alloc()

```
type(fgsl_integration_qawo_table) function fgsl_integration_qawo_table_alloc (
             real(fgsl_double), intent(in) omega,
             real(fgsl_double), intent(in) l,
             integer(fgsl_int), intent(in) sine,
             integer(fgsl_size_t), intent(in) n )
```

49.14.1.26 fgsl_integration_qawo_table_free()

```
subroutine fgsl_integration_qawo_table_free (
             type(fgsl_integration_qawo_table), intent(inout) w )
```

49.14.1.27 fgsl_integration_qawo_table_set()

```
integer(fgsl_int) function fgsl_integration_qawo_table_set (
             type(fgsl_integration_qawo_table), intent(inout) t,
             real(fgsl_double), intent(in) omega,
             real(fgsl_double), intent(in) l,
             integer(fgsl_int), intent(in) sine )
```

49.14.1.28 fgsl_integration_qawo_table_set_length()

```
integer(fgsl_int) function fgsl_integration_qawo_table_set_length (
             type(fgsl_integration_qawo_table), intent(inout) t,
             real(fgsl_double), intent(in) l )
```

49.14.1.29 fgsl_integration_qawo_table_status()

```
logical function fgsl_integration_qawo_table_status (
             type(fgsl_integration_qawo_table), intent(in) integration_qawo_table )
```

49.14.1.30 fgsl_integration_qaws()

```
integer(fgsl_int) function fgsl_integration_qaws (
             type(fgsl_function), intent(in) f,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b,
             type(fgsl_integration_qaws_table), intent(in) t,
             real(fgsl_double), intent(in) epsabs,
             real(fgsl_double), intent(in) epsrel,
             integer(fgsl_size_t), intent(in) limit,
             type(fgsl_integration_workspace), intent(inout) workspace,
             real(fgsl_double), intent(out) result,
             real(fgsl_double), intent(out) abserr )
```

49.14.1.31 fgsl_integration_qaws_table_alloc()

```
type(fgsl_integration_qaws_table) function fgsl_integration_qaws_table_alloc (
             real(fgsl_double), intent(in) alpha,
             real(fgsl_double), intent(in) beta,
             integer(fgsl_int), intent(in) mu,
             integer(fgsl_int), intent(in) nu )
```

49.14.1.32 fgsl_integration_qaws_table_free()

```
subroutine fgsl_integration_qaws_table_free (
             type(fgsl_integration_qaws_table), intent(inout) w )
```

49.14.1.33 fgsl_integration_qaws_table_set()

```
integer(c_int) function fgsl_integration_qaws_table_set (
             type(fgsl_integration_qaws_table) t,
             real(fgsl_double), intent(in) alpha,
             real(fgsl_double), intent(in) beta,
             integer(fgsl_int), intent(in) mu,
             integer(fgsl_int), intent(in) nu )
```

49.14.1.34 fgsl_integration_qaws_table_status()

```
logical function fgsl_integration_qaws_table_status (
            type(fgsl_integration_qaws_table), intent(in) integration_qaws_table )
```

49.14.1.35 fgsl_integration_qng()

```
integer(fgsl_int) function fgsl_integration_qng (
            type(fgsl_function), intent(in) f,
            real(fgsl_double), intent(in) a,
            real(fgsl_double), intent(in) b,
            real(fgsl_double), intent(in) epsabs,
            real(fgsl_double), intent(in) epsrel,
            real(fgsl_double), intent(out) result,
            real(fgsl_double), intent(out) abserr,
            integer(fgsl_size_t), intent(inout) neval )
```

49.14.1.36 fgsl_integration_romberg()

```
integer(fgsl_int) function fgsl_integration_romberg (
            type(fgsl_function) f,
            real(fgsl_double), intent(in) a,
            real(fgsl_double), intent(in) b,
            real(fgsl_double), intent(in) epsabs,
            real(fgsl_double), intent(in) epsrel,
            real(fgsl_double), intent(inout) result,
            integer(c_size_t), intent(inout) neval,
            type(fgsl_integration_romberg_workspace), intent(inout) w )
```

49.14.1.37 fgsl_integration_romberg_alloc()

```
type(fgsl_integration_romberg_workspace) function fgsl_integration_romberg_alloc (
            integer(fgsl_size_t), intent(in) n )
```

49.14.1.38 fgsl_integration_romberg_free()

```
subroutine fgsl_integration_romberg_free (
            type(fgsl_integration_romberg_workspace), intent(inout) w )
```

49.14.1.39 fgsl_integration_workspace_alloc()

```
type(fgsl_integration_workspace) function fgsl_integration_workspace_alloc (
            integer(fgsl_size_t), intent(in) n )
```

49.14.1.40 fgsl_integration_workspace_free()

```
subroutine fgsl_integration_workspace_free (
            type(fgsl_integration_workspace), intent(inout) w )
```

49.14.1.41 fgsl_integration_workspace_status()

```
logical function fgsl_integration_workspace_status (
            type(fgsl_integration_workspace), intent(in) integration_workspace )
```

49.14.1.42 fgsl_sizeof_integration_qawo_table()

```
integer(fgsl_size_t) function fgsl_sizeof_integration_qawo_table (
            type(fgsl_integration_qawo_table), intent(in) w )
```

49.14.1.43 fgsl_sizeof_integration_qaws_table()

```
integer(fgsl_size_t) function fgsl_sizeof_integration_qaws_table (
            type(fgsl_integration_qaws_table), intent(in) w )
```

49.14.1.44 fgsl_sizeof_integration_workspace()

```
integer(fgsl_size_t) function fgsl_sizeof_integration_workspace (
            type(fgsl_integration_workspace), intent(in) w )
```

49.15 api/interp.finc File Reference

Functions/Subroutines

- type(fgsl_interp) function fgsl_interp_alloc (interp_type, size)
- subroutine fgsl_interp_free (interp)
- type(fgsl_interp_accel) function fgsl_interp_accel_alloc ()
- subroutine fgsl_interp_accel_free (acc)
- logical function fgsl_interp_status (interp)
- logical function fgsl_interp2d_status (interp)
- logical function fgsl_interp_accel_status (acc)
- integer(fgsl_int) function fgsl_interp_init (interp, xa, ya)
- real(fgsl_double) function fgsl_interp_eval (interp, xa, ya, x, acc)
- integer(fgsl_int) function fgsl_interp_eval_e (interp, xa, ya, x, acc, y)
- real(fgsl_double) function fgsl_interp_eval_integ (interp, xa, ya, a, b, acc)
- integer(fgsl_int) function fgsl_interp_eval_integ_e (interp, xa, ya, a, b, acc, result)
- real(fgsl_double) function fgsl_interp_eval_deriv (interp, xa, ya, x, acc)
- integer(fgsl_int) function fgsl_interp_eval_deriv_e (interp, xa, ya, x, acc, d)
- real(fgsl_double) function fgsl_interp_eval_deriv2 (interp, xa, ya, x, acc)
- integer(fgsl_int) function fgsl_interp_eval_deriv2_e (interp, xa, ya, x, acc, d2)
- character(kind=fgsl_char, len=fgsl_strmax) function fgsl_interp_name (interp)
- integer(fgsl_long) function fgsl_interp_min_size (interp)
- integer(fgsl_long) function fgsl_interp_type_min_size (interp)
- integer(fgsl_size_t) function fgsl_interp_bsearch (xa, x, index_lo, index_hi)
- integer(fgsl_size_t) function fgsl_interp_accel_find (acc, xa, x)
- type(fgsl_spline) function fgsl_spline_alloc (interp_type, size)
- subroutine fgsl_spline_free (spline)
- integer(fgsl_int) function fgsl_spline_init (spline, xa, ya)
- character(len=fgsl_strmax) function fgsl_spline_name (spline)
- integer(fgsl_long) function fgsl_spline_min_size (spline)
- real(fgsl_double) function fgsl_spline_eval (spline, x, acc)
- integer(fgsl_int) function fgsl_spline_eval_e (spline, x, acc, y)
- real(fgsl_double) function fgsl_spline_eval_deriv (spline, x, acc)
- integer(fgsl_int) function fgsl_spline_eval_deriv_e (spline, x, acc, y)
- real(fgsl_double) function fgsl_spline_eval_deriv2 (spline, x, acc)
- integer(fgsl_int) function fgsl_spline_eval_deriv2_e (spline, x, acc, y)
- real(fgsl_double) function fgsl_spline_eval_integ (spline, a, b, acc)
- integer(fgsl_int) function fgsl_spline_eval_integ_e (spline, a, b, acc, y)
- logical function fgsl_spline_status (spline)
- logical function fgsl_spline2d_status (spline)
- integer(fgsl_size_t) function fgsl_sizeof_interp (w)
- type(fgsl_interp2d) function fgsl_interp2d_alloc (T, xsize, ysize)
- character(kind=fgsl_char, len=fgsl_strmax) function fgsl_interp2d_name (interp)
- integer(fgsl_size_t) function fgsl_interp2d_min_size (interp)
- integer(fgsl_size_t) function fgsl_interp2d_type_min_size (T)
- integer(fgsl_int) function fgsl_interp2d_init (interp, xa, ya, za)
- subroutine fgsl_interp2d_free (interp)
- real(fgsl_double) function fgsl_interp2d_eval (interp, xarr, yarr, zarr, x, y, xa, ya)
- real(fgsl_double) function fgsl_interp2d_eval_extrap (interp, xarr, yarr, zarr, x, y, xa, ya)
- integer(fgsl_int) function fgsl_interp2d_eval_e (interp, xarr, yarr, zarr, x, y, xa, ya, z)
- integer(fgsl_int) function fgsl_interp2d_eval_e_extrap (interp, xarr, yarr, zarr, x, y, xa, ya, z)
- real(fgsl_double) function fgsl_interp2d_eval_deriv_x (interp, xarr, yarr, zarr, x, y, xa, ya)
- integer(fgsl_int) function fgsl_interp2d_eval_deriv_x_e (interp, xarr, yarr, zarr, x, y, xa, ya, z)
- real(fgsl_double) function fgsl_interp2d_eval_deriv_y (interp, xarr, yarr, zarr, x, y, xa, ya)

- integer(fgsl_int) function fgsl_interp2d_eval_deriv_y_e (interp, xarr, yarr, zarr, x, y, xa, ya, z)
- real(fgsl_double) function fgsl_interp2d_eval_deriv_xx (interp, xarr, yarr, zarr, x, y, xa, ya)
- integer(fgsl_int) function fgsl_interp2d_eval_deriv_xx_e (interp, xarr, yarr, zarr, x, y, xa, ya, z)
- real(fgsl_double) function fgsl_interp2d_eval_deriv_yy (interp, xarr, yarr, zarr, x, y, xa, ya)
- integer(fgsl_int) function fgsl_interp2d_eval_deriv_yy_e (interp, xarr, yarr, zarr, x, y, xa, ya, z)
- real(fgsl_double) function fgsl_interp2d_eval_deriv_xy (interp, xarr, yarr, zarr, x, y, xa, ya)
- integer(fgsl_int) function fgsl_interp2d_eval_deriv_xy_e (interp, xarr, yarr, zarr, x, y, xa, ya, z)
- type(fgsl_spline2d) function fgsl_spline2d_alloc (T, xsize, ysize)
- integer(fgsl_int) function fgsl_spline2d_init (interp, xa, ya, za)
- subroutine fgsl_spline2d_free (interp)
- real(fgsl_double) function fgsl_spline2d_eval (interp, x, y, xa, ya)
- integer(fgsl_int) function fgsl_spline2d_eval_e (interp, x, y, xa, ya, z)
- real(fgsl_double) function fgsl_spline2d_eval_deriv_x (interp, x, y, xa, ya)
- integer(fgsl_int) function fgsl_spline2d_eval_deriv_x_e (interp, x, y, xa, ya, z)
- real(fgsl_double) function fgsl_spline2d_eval_deriv_y (interp, x, y, xa, ya)
- integer(fgsl_int) function fgsl_spline2d_eval_deriv_y_e (interp, x, y, xa, ya, z)
- real(fgsl_double) function fgsl_spline2d_eval_deriv_xx (interp, x, y, xa, ya)
- integer(fgsl_int) function fgsl_spline2d_eval_deriv_xx_e (interp, x, y, xa, ya, z)
- real(fgsl_double) function fgsl_spline2d_eval_deriv_yy (interp, x, y, xa, ya)
- integer(fgsl_int) function fgsl_spline2d_eval_deriv_yy_e (interp, x, y, xa, ya, z)
- real(fgsl_double) function fgsl_spline2d_eval_deriv_xy (interp, x, y, xa, ya)
- integer(fgsl_int) function fgsl_spline2d_eval_deriv_xy_e (interp, x, y, xa, ya, z)
- character(kind=fgsl_char, len=fgsl_strmax) function fgsl_spline2d_name (interp)
- integer(fgsl_size_t) function fgsl_spline2d_min_size (interp)

49.15.1 Function/Subroutine Documentation

49.15.1.1 fgsl_interp2d_alloc()

```
type(fgsl_interp2d) function fgsl_interp2d_alloc (
             type(fgsl_interp2d_type), intent(in) T,
             integer(fgsl_size_t), intent(in) xsize,
             integer(fgsl_size_t), intent(in) ysize )
```

49.15.1.2 fgsl_interp2d_eval()

```
real(fgsl_double) function fgsl_interp2d_eval (
             type(fgsl_interp2d), intent(in) interp,
             real(fgsl_double), dimension(:), intent(in), target, contiguous xarr,
             real(fgsl_double), dimension(:), intent(in), target, contiguous yarr,
             real(fgsl_double), dimension(:,:), intent(in), target, contiguous zarr,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             type(fgsl_interp_accel), intent(inout) xa,
             type(fgsl_interp_accel), intent(inout) ya )
```

49.15.1.3 fgsl_interp2d_eval_deriv_x()

```
real(fgsl_double) function fgsl_interp2d_eval_deriv_x (
             type(fgsl_interp2d), intent(in) interp,
             real(fgsl_double), dimension(:), intent(in), target, contiguous xarr,
             real(fgsl_double), dimension(:), intent(in), target, contiguous yarr,
             real(fgsl_double), dimension(:,:), intent(in), target, contiguous zarr,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             type(fgsl_interp_accel), intent(inout) xa,
             type(fgsl_interp_accel), intent(inout) ya )
```

49.15.1.4 fgsl_interp2d_eval_deriv_x_e()

```
integer(fgsl_int) function fgsl_interp2d_eval_deriv_x_e (
             type(fgsl_interp2d), intent(in) interp,
             real(fgsl_double), dimension(:), intent(in), target, contiguous xarr,
             real(fgsl_double), dimension(:), intent(in), target, contiguous yarr,
             real(fgsl_double), dimension(:,:), intent(in), target, contiguous zarr,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             type(fgsl_interp_accel), intent(inout) xa,
             type(fgsl_interp_accel), intent(inout) ya,
             real(fgsl_double), intent(out) z )
```

49.15.1.5 fgsl_interp2d_eval_deriv_xx()

```
real(fgsl_double) function fgsl_interp2d_eval_deriv_xx (
             type(fgsl_interp2d), intent(in) interp,
             real(fgsl_double), dimension(:), intent(in), target, contiguous xarr,
             real(fgsl_double), dimension(:), intent(in), target, contiguous yarr,
             real(fgsl_double), dimension(:,:), intent(in), target, contiguous zarr,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             type(fgsl_interp_accel), intent(inout) xa,
             type(fgsl_interp_accel), intent(inout) ya )
```

49.15.1.6 fgsl_interp2d_eval_deriv_xx_e()

```
integer(fgsl_int) function fgsl_interp2d_eval_deriv_xx_e (
             type(fgsl_interp2d), intent(in) interp,
             real(fgsl_double), dimension(:), intent(in), target, contiguous xarr,
             real(fgsl_double), dimension(:), intent(in), target, contiguous yarr,
             real(fgsl_double), dimension(:,:), intent(in), target, contiguous zarr,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             type(fgsl_interp_accel), intent(inout) xa,
             type(fgsl_interp_accel), intent(inout) ya,
             real(fgsl_double), intent(out) z )
```

49.15.1.7 fgsl_interp2d_eval_deriv_xy()

```
real(fgsl_double) function fgsl_interp2d_eval_deriv_xy (
             type(fgsl_interp2d), intent(in) interp,
             real(fgsl_double), dimension(:), intent(in), target, contiguous xarr,
             real(fgsl_double), dimension(:), intent(in), target, contiguous yarr,
             real(fgsl_double), dimension(:,:), intent(in), target, contiguous zarr,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             type(fgsl_interp_accel), intent(inout) xa,
             type(fgsl_interp_accel), intent(inout) ya )
```

49.15.1.8 fgsl_interp2d_eval_deriv_xy_e()

```
integer(fgsl_int) function fgsl_interp2d_eval_deriv_xy_e (
             type(fgsl_interp2d), intent(in) interp,
             real(fgsl_double), dimension(:), intent(in), target, contiguous xarr,
             real(fgsl_double), dimension(:), intent(in), target, contiguous yarr,
             real(fgsl_double), dimension(:,:), intent(in), target, contiguous zarr,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             type(fgsl_interp_accel), intent(inout) xa,
             type(fgsl_interp_accel), intent(inout) ya,
             real(fgsl_double), intent(out) z )
```

49.15.1.9 fgsl_interp2d_eval_deriv_y()

```
real(fgsl_double) function fgsl_interp2d_eval_deriv_y (
             type(fgsl_interp2d), intent(in) interp,
             real(fgsl_double), dimension(:), intent(in), target, contiguous xarr,
             real(fgsl_double), dimension(:), intent(in), target, contiguous yarr,
             real(fgsl_double), dimension(:,:), intent(in), target, contiguous zarr,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             type(fgsl_interp_accel), intent(inout) xa,
             type(fgsl_interp_accel), intent(inout) ya )
```

49.15.1.10 fgsl_interp2d_eval_deriv_y_e()

```
integer(fgsl_int) function fgsl_interp2d_eval_deriv_y_e (
             type(fgsl_interp2d), intent(in) interp,
             real(fgsl_double), dimension(:), intent(in), target, contiguous xarr,
             real(fgsl_double), dimension(:), intent(in), target, contiguous yarr,
             real(fgsl_double), dimension(:,:), intent(in), target, contiguous zarr,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             type(fgsl_interp_accel), intent(inout) xa,
             type(fgsl_interp_accel), intent(inout) ya,
             real(fgsl_double), intent(out) z )
```

49.15.1.11 fgsl_interp2d_eval_deriv_yy()

```
real(fgsl_double) function fgsl_interp2d_eval_deriv_yy (
             type(fgsl_interp2d), intent(in) interp,
             real(fgsl_double), dimension(:), intent(in), target, contiguous xarr,
             real(fgsl_double), dimension(:), intent(in), target, contiguous yarr,
             real(fgsl_double), dimension(:,:), intent(in), target, contiguous zarr,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             type(fgsl_interp_accel), intent(inout) xa,
             type(fgsl_interp_accel), intent(inout) ya )
```

49.15.1.12 fgsl_interp2d_eval_deriv_yy_e()

```
integer(fgsl_int) function fgsl_interp2d_eval_deriv_yy_e (
             type(fgsl_interp2d), intent(in) interp,
             real(fgsl_double), dimension(:), intent(in), target, contiguous xarr,
             real(fgsl_double), dimension(:), intent(in), target, contiguous yarr,
             real(fgsl_double), dimension(:,:), intent(in), target, contiguous zarr,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             type(fgsl_interp_accel), intent(inout) xa,
             type(fgsl_interp_accel), intent(inout) ya,
             real(fgsl_double), intent(out) z )
```

49.15.1.13 fgsl_interp2d_eval_e()

```
integer(fgsl_int) function fgsl_interp2d_eval_e (
             type(fgsl_interp2d), intent(in) interp,
             real(fgsl_double), dimension(:), intent(in), target, contiguous xarr,
             real(fgsl_double), dimension(:), intent(in), target, contiguous yarr,
             real(fgsl_double), dimension(:,:), intent(in), target, contiguous zarr,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             type(fgsl_interp_accel), intent(inout) xa,
             type(fgsl_interp_accel), intent(inout) ya,
             real(fgsl_double), intent(out) z )
```

49.15.1.14 fgsl_interp2d_eval_e_extrap()

```
integer(fgsl_int) function fgsl_interp2d_eval_e_extrap (
             type(fgsl_interp2d), intent(in) interp,
             real(fgsl_double), dimension(:), intent(in), target, contiguous xarr,
             real(fgsl_double), dimension(:), intent(in), target, contiguous yarr,
             real(fgsl_double), dimension(:,:), intent(in), target, contiguous zarr,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             type(fgsl_interp_accel), intent(inout) xa,
             type(fgsl_interp_accel), intent(inout) ya,
             real(fgsl_double), intent(out) z )
```

49.15.1.15 fgsl_interp2d_eval_extrap()

```
real(fgsl_double) function fgsl_interp2d_eval_extrap (
             type(fgsl_interp2d), intent(in) interp,
             real(fgsl_double), dimension(:), intent(in), target, contiguous xarr,
             real(fgsl_double), dimension(:), intent(in), target, contiguous yarr,
             real(fgsl_double), dimension(:,:), intent(in), target, contiguous zarr,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             type(fgsl_interp_accel), intent(inout) xa,
             type(fgsl_interp_accel), intent(inout) ya )
```

49.15.1.16 fgsl_interp2d_free()

```
subroutine fgsl_interp2d_free (
             type(fgsl_interp2d), intent(in) interp )
```

49.15.1.17 fgsl_interp2d_init()

```
integer(fgsl_int) function fgsl_interp2d_init (
             type(fgsl_interp2d), intent(in) interp,
             real(fgsl_double), dimension(:), intent(in), target, contiguous xa,
             real(fgsl_double), dimension(:), intent(in), target, contiguous ya,
             real(fgsl_double), dimension(:,:), intent(in), target, contiguous za )
```

49.15.1.18 fgsl_interp2d_min_size()

```
integer(fgsl_size_t) function fgsl_interp2d_min_size (
             type(fgsl_interp2d), intent(in) interp )
```

49.15.1.19 fgsl_interp2d_name()

```
character(kind=fgsl_char,len=fgsl_strmax) function fgsl_interp2d_name (
             type(fgsl_interp2d), intent(in) interp )
```

49.15.1.20 fgsl_interp2d_status()

```
logical function fgsl_interp2d_status (
             type(fgsl_interp2d), intent(in) interp )
```

49.15.1.21 fgsl_interp2d_type_min_size()

```
integer(fgsl_size_t) function fgsl_interp2d_type_min_size (
            type(fgsl_interp2d_type), intent(in) T )
```

49.15.1.22 fgsl_interp_accel_alloc()

```
type(fgsl_interp_accel) function fgsl_interp_accel_alloc
```

49.15.1.23 fgsl_interp_accel_find()

```
integer(fgsl_size_t) function fgsl_interp_accel_find (
            type(fgsl_interp_accel), intent(inout) acc,
            real(fgsl_double), dimension(:), intent(in), target, contiguous xa,
            real(fgsl_double), intent(in) x )
```

49.15.1.24 fgsl_interp_accel_free()

```
subroutine fgsl_interp_accel_free (
            type(fgsl_interp_accel), intent(inout) acc )
```

49.15.1.25 fgsl_interp_accel_status()

```
logical function fgsl_interp_accel_status (
            type(fgsl_interp_accel), intent(in) acc )
```

49.15.1.26 fgsl_interp_alloc()

```
type(fgsl_interp) function fgsl_interp_alloc (
            type(fgsl_interp_type), intent(in) interp_type,
            integer(fgsl_size_t), intent(in) size )
```

49.15.1.27 fgsl_interp_bsearch()

```
integer(fgsl_size_t) function fgsl_interp_bsearch (
             real(fgsl_double), dimension(:), intent(in), target, contiguous xa,
             real(fgsl_double), intent(in) x,
             integer(fgsl_size_t), intent(in) index_lo,
             integer(fgsl_size_t), intent(in) index_hi )
```

49.15.1.28 fgsl_interp_eval()

```
real(fgsl_double) function fgsl_interp_eval (
             type(fgsl_interp), intent(in) interp,
             real(fgsl_double), dimension(:), intent(in), target, contiguous xa,
             real(fgsl_double), dimension(:), intent(in), target, contiguous ya,
             real(fgsl_double), intent(in) x,
             type(fgsl_interp_accel), intent(inout) acc )
```

49.15.1.29 fgsl_interp_eval_deriv()

```
real(fgsl_double) function fgsl_interp_eval_deriv (
             type(fgsl_interp), intent(in) interp,
             real(fgsl_double), dimension(:), intent(in), target, contiguous xa,
             real(fgsl_double), dimension(:), intent(in), target, contiguous ya,
             real(fgsl_double), intent(in) x,
             type(fgsl_interp_accel), intent(inout) acc )
```

49.15.1.30 fgsl_interp_eval_deriv2()

```
real(fgsl_double) function fgsl_interp_eval_deriv2 (
             type(fgsl_interp), intent(in) interp,
             real(fgsl_double), dimension(:), intent(in), target, contiguous xa,
             real(fgsl_double), dimension(:), intent(in), target, contiguous ya,
             real(fgsl_double), intent(in) x,
             type(fgsl_interp_accel), intent(inout) acc )
```

49.15.1.31 fgsl_interp_eval_deriv2_e()

```
integer(fgsl_int) function fgsl_interp_eval_deriv2_e (
             type(fgsl_interp), intent(in) interp,
             real(fgsl_double), dimension(:), intent(in), target, contiguous xa,
             real(fgsl_double), dimension(:), intent(in), target, contiguous ya,
             real(fgsl_double), intent(in) x,
             type(fgsl_interp_accel), intent(inout) acc,
             real(fgsl_double), intent(out) d2 )
```

49.15.1.32 fgsl_interp_eval_deriv_e()

```
integer(fgsl_int) function fgsl_interp_eval_deriv_e (
             type(fgsl_interp), intent(in) interp,
             real(fgsl_double), dimension(:), intent(in), target, contiguous xa,
             real(fgsl_double), dimension(:), intent(in), target, contiguous ya,
             real(fgsl_double), intent(in) x,
             type(fgsl_interp_accel), intent(inout) acc,
             real(fgsl_double), intent(out) d )
```

49.15.1.33 fgsl_interp_eval_e()

```
integer(fgsl_int) function fgsl_interp_eval_e (
             type(fgsl_interp), intent(in) interp,
             real(fgsl_double), dimension(:), intent(in), target, contiguous xa,
             real(fgsl_double), dimension(:), intent(in), target, contiguous ya,
             real(fgsl_double), intent(in) x,
             type(fgsl_interp_accel), intent(inout) acc,
             real(fgsl_double), intent(out) y )
```

49.15.1.34 fgsl_interp_eval_integ()

```
real(fgsl_double) function fgsl_interp_eval_integ (
             type(fgsl_interp), intent(in) interp,
             real(fgsl_double), dimension(:), intent(in), target, contiguous xa,
             real(fgsl_double), dimension(:), intent(in), target, contiguous ya,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b,
             type(fgsl_interp_accel), intent(inout) acc )
```

49.15.1.35 fgsl_interp_eval_integ_e()

```
integer(fgsl_int) function fgsl_interp_eval_integ_e (
             type(fgsl_interp), intent(in) interp,
             real(fgsl_double), dimension(:), intent(in), target, contiguous xa,
             real(fgsl_double), dimension(:), intent(in), target, contiguous ya,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b,
             type(fgsl_interp_accel), intent(inout) acc,
             real(fgsl_double), intent(out) result )
```

49.15.1.36 fgsl_interp_free()

```
subroutine fgsl_interp_free (
             type(fgsl_interp), intent(inout) interp )
```

49.15.1.37 fgsl_interp_init()

```
integer(fgsl_int) function fgsl_interp_init (
             type(fgsl_interp), intent(inout) interp,
             real(fgsl_double), dimension(:), intent(in), target, contiguous xa,
             real(fgsl_double), dimension(:), intent(in), target, contiguous ya )
```

49.15.1.38 fgsl_interp_min_size()

```
integer(fgsl_long) function fgsl_interp_min_size (
             type(fgsl_interp), intent(in) interp )
```

49.15.1.39 fgsl_interp_name()

```
character(kind=fgsl_char,len=fgsl_strmax) function fgsl_interp_name (
             type(fgsl_interp), intent(in) interp )
```

49.15.1.40 fgsl_interp_status()

```
logical function fgsl_interp_status (
             type(fgsl_interp), intent(in) interp )
```

49.15.1.41 fgsl_interp_type_min_size()

```
integer(fgsl_long) function fgsl_interp_type_min_size (
             type(fgsl_interp_type), intent(in) interp )
```

49.15.1.42 fgsl_sizeof_interp()

```
integer(fgsl_size_t) function fgsl_sizeof_interp (
             type(fgsl_interp), intent(in) w )
```

49.15.1.43 fgsl_spline2d_alloc()

```
type(fgsl_spline2d) function fgsl_spline2d_alloc (
             type(fgsl_interp2d_type), intent(in) T,
             integer(fgsl_size_t), intent(in) xsize,
             integer(fgsl_size_t), intent(in) ysize )
```

49.15.1.44 fgsl_spline2d_eval()

```
real(fgsl_double) function fgsl_spline2d_eval (
             type(fgsl_spline2d), intent(in) interp,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             type(fgsl_interp_accel), intent(inout) xa,
             type(fgsl_interp_accel), intent(inout) ya )
```

49.15.1.45 fgsl_spline2d_eval_deriv_x()

```
real(fgsl_double) function fgsl_spline2d_eval_deriv_x (
             type(fgsl_spline2d), intent(in) interp,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             type(fgsl_interp_accel), intent(inout) xa,
             type(fgsl_interp_accel), intent(inout) ya )
```

49.15.1.46 fgsl_spline2d_eval_deriv_x_e()

```
integer(fgsl_int) function fgsl_spline2d_eval_deriv_x_e (
             type(fgsl_spline2d), intent(in) interp,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             type(fgsl_interp_accel), intent(inout) xa,
             type(fgsl_interp_accel), intent(inout) ya,
             real(fgsl_double), intent(out) z )
```

49.15.1.47 fgsl_spline2d_eval_deriv_xx()

```
real(fgsl_double) function fgsl_spline2d_eval_deriv_xx (
             type(fgsl_spline2d), intent(in) interp,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             type(fgsl_interp_accel), intent(inout) xa,
             type(fgsl_interp_accel), intent(inout) ya )
```

49.15.1.48 fgsl_spline2d_eval_deriv_xx_e()

```
integer(fgsl_int) function fgsl_spline2d_eval_deriv_xx_e (
             type(fgsl_spline2d), intent(in) interp,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             type(fgsl_interp_accel), intent(inout) xa,
             type(fgsl_interp_accel), intent(inout) ya,
             real(fgsl_double), intent(out) z )
```

49.15.1.49 fgsl_spline2d_eval_deriv_xy()

```
real(fgsl_double) function fgsl_spline2d_eval_deriv_xy (
             type(fgsl_spline2d), intent(in) interp,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             type(fgsl_interp_accel), intent(inout) xa,
             type(fgsl_interp_accel), intent(inout) ya )
```

49.15.1.50 fgsl_spline2d_eval_deriv_xy_e()

```
integer(fgsl_int) function fgsl_spline2d_eval_deriv_xy_e (
             type(fgsl_spline2d), intent(in) interp,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             type(fgsl_interp_accel), intent(inout) xa,
             type(fgsl_interp_accel), intent(inout) ya,
             real(fgsl_double), intent(out) z )
```

49.15.1.51 fgsl_spline2d_eval_deriv_y()

```
real(fgsl_double) function fgsl_spline2d_eval_deriv_y (
             type(fgsl_spline2d), intent(in) interp,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             type(fgsl_interp_accel), intent(inout) xa,
             type(fgsl_interp_accel), intent(inout) ya )
```

49.15.1.52 fgsl_spline2d_eval_deriv_y_e()

```
integer(fgsl_int) function fgsl_spline2d_eval_deriv_y_e (
             type(fgsl_spline2d), intent(in) interp,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             type(fgsl_interp_accel), intent(inout) xa,
             type(fgsl_interp_accel), intent(inout) ya,
             real(fgsl_double), intent(out) z )
```

49.15.1.53 fgsl_spline2d_eval_deriv_yy()

```
real(fgsl_double) function fgsl_spline2d_eval_deriv_yy (
             type(fgsl_spline2d), intent(in) interp,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             type(fgsl_interp_accel), intent(inout) xa,
             type(fgsl_interp_accel), intent(inout) ya )
```

49.15.1.54 fgsl_spline2d_eval_deriv_yy_e()

```
integer(fgsl_int) function fgsl_spline2d_eval_deriv_yy_e (
             type(fgsl_spline2d), intent(in) interp,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             type(fgsl_interp_accel), intent(inout) xa,
             type(fgsl_interp_accel), intent(inout) ya,
             real(fgsl_double), intent(out) z )
```

49.15.1.55 fgsl_spline2d_eval_e()

```
integer(fgsl_int) function fgsl_spline2d_eval_e (
             type(fgsl_spline2d), intent(in) interp,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             type(fgsl_interp_accel), intent(inout) xa,
             type(fgsl_interp_accel), intent(inout) ya,
             real(fgsl_double), intent(out) z )
```

49.15.1.56 fgsl_spline2d_free()

```
subroutine fgsl_spline2d_free (
             type(fgsl_spline2d), intent(in) interp )
```

49.15.1.57 fgsl_spline2d_init()

```
integer(fgsl_int) function fgsl_spline2d_init (
             type(fgsl_spline2d), intent(in) interp,
             real(fgsl_double), dimension(:), intent(in), target, contiguous xa,
             real(fgsl_double), dimension(:), intent(in), target, contiguous ya,
             real(fgsl_double), dimension(:,:), intent(in), target, contiguous za )
```

49.15.1.58 fgsl_spline2d_min_size()

```
integer(fgsl_size_t) function fgsl_spline2d_min_size (
             type(fgsl_spline2d), intent(in) interp )
```

49.15.1.59 fgsl_spline2d_name()

```
character(kind=fgsl_char,len=fgsl_strmax) function fgsl_spline2d_name (
             type(fgsl_spline2d), intent(in) interp )
```

49.15.1.60 fgsl_spline2d_status()

```
logical function fgsl_spline2d_status (
             type(fgsl_spline2d), intent(in) spline )
```

49.15.1.61 fgsl_spline_alloc()

```
type(fgsl_spline) function fgsl_spline_alloc (
             type(fgsl_interp_type), intent(in) interp_type,
             integer(fgsl_size_t), intent(in) size )
```

49.15.1.62 fgsl_spline_eval()

```
real(fgsl_double) function fgsl_spline_eval (
             type(fgsl_spline), intent(in) spline,
             real(fgsl_double), intent(in) x,
             type(fgsl_interp_accel), intent(inout) acc )
```

49.15.1.63 fgsl_spline_eval_deriv()

```
real(fgsl_double) function fgsl_spline_eval_deriv (
             type(fgsl_spline), intent(in) spline,
             real(fgsl_double), intent(in) x,
             type(fgsl_interp_accel), intent(inout) acc )
```

49.15.1.64 fgsl_spline_eval_deriv2()

```
real(fgsl_double) function fgsl_spline_eval_deriv2 (
             type(fgsl_spline), intent(in) spline,
             real(fgsl_double), intent(in) x,
             type(fgsl_interp_accel), intent(inout) acc )
```

49.15.1.65 fgsl_spline_eval_deriv2_e()

```
integer(fgsl_int) function fgsl_spline_eval_deriv2_e (
             type(fgsl_spline), intent(in) spline,
             real(fgsl_double), intent(in) x,
             type(fgsl_interp_accel), intent(inout) acc,
             real(fgsl_double), intent(out) y )
```

49.15.1.66 fgsl_spline_eval_deriv_e()

```
integer(fgsl_int) function fgsl_spline_eval_deriv_e (
             type(fgsl_spline), intent(in) spline,
             real(fgsl_double), intent(in) x,
             type(fgsl_interp_accel), intent(inout) acc,
             real(fgsl_double), intent(out) y )
```

49.15.1.67 fgsl_spline_eval_e()

```
integer(fgsl_int) function fgsl_spline_eval_e (
             type(fgsl_spline), intent(in) spline,
             real(fgsl_double), intent(in) x,
             type(fgsl_interp_accel), intent(inout) acc,
             real(fgsl_double), intent(out) y )
```

49.15.1.68 fgsl_spline_eval_integ()

```
real(fgsl_double) function fgsl_spline_eval_integ (
             type(fgsl_spline), intent(in) spline,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b,
             type(fgsl_interp_accel), intent(inout) acc )
```

49.15.1.69 fgsl_spline_eval_integ_e()

```
integer(fgsl_int) function fgsl_spline_eval_integ_e (
             type(fgsl_spline), intent(in) spline,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b,
             type(fgsl_interp_accel), intent(inout) acc,
             real(fgsl_double), intent(out) y )
```

49.15.1.70 fgsl_spline_free()

```
subroutine fgsl_spline_free (
             type(fgsl_spline), intent(inout) spline )
```

49.15.1.71 fgsl_spline_init()

```
integer(fgsl_int) function fgsl_spline_init (
             type(fgsl_spline), intent(inout) spline,
             real(fgsl_double), dimension(:), intent(in), target, contiguous xa,
             real(fgsl_double), dimension(:), intent(in), target, contiguous ya )
```

49.15.1.72 fgsl_spline_min_size()

```
integer(fgsl_long) function fgsl_spline_min_size (
             type(fgsl_spline), intent(in) spline )
```

49.15.1.73 fgsl_spline_name()

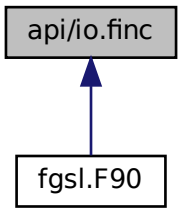
```
character(len=fgsl_strmax) function fgsl_spline_name (
             type(fgsl_spline), intent(in) spline )
```

49.15.1.74 fgsl_spline_status()

```
logical function fgsl_spline_status (
             type(fgsl_spline), intent(in) spline )
```

49.16 api/io.finc File Reference

This graph shows which files directly or indirectly include this file:



Functions/Subroutines

- type(fgsl_file) function fgsl_open (path, mode)

  fgsl_open maps the POSIX call fopen() to Fortran
- integer(fgsl_int) function fgsl_close (fd)

  fgsl_open maps the POSIX call fclose() to Fortran
- type(fgsl_file) function fgsl_stdin ()

  fgsl_stdin produces a fgsl_file object corresponding to C standard input
- type(fgsl_file) function fgsl_stdout ()

  fgsl_stdout produces a fgsl_file object corresponding to C standard output
- type(fgsl_file) function fgsl_stderr ()

  fgsl_stderr produces a fgsl_file object corresponding to C standard error
- integer(fgsl_int) function fgsl_flush (file)

  fgsl_flush flushes a fgsl_file object
- logical function fgsl_file_status (file)

49.16.1 Function/Subroutine Documentation

49.16.1.1 fgsl_close()

```
integer(fgsl_int) function fgsl_close (
             type(fgsl_file), intent(inout) fd )
```

fgsl_open maps the POSIX call fclose() to Fortran

Parameters

fd	- on entry: open file object

Returns

Status.

49.16.1.2 fgsl_file_status()

```
logical function fgsl_file_status (
             type(fgsl_file), intent(in) file )
```

49.16.1.3 fgsl_flush()

```
integer(fgsl_int) function fgsl_flush (
             type(fgsl_file), intent(in) file )
```

fgsl_flush flushes a fgsl_file object

49.16.1.4 fgsl_open()

```
type(fgsl_file) function fgsl_open (
             character(kind=fgsl_char, len=*), intent(in) path,
             character(kind=fgsl_char, len=*), intent(in) mode )
```

fgsl_open maps the POSIX call fopen() to Fortran

Parameters

path	- string specifying the path name of the file to be opened
mode	- string containing the opening mode

Returns

object of type fgsl_file which can be used in other I/O calls.

49.16.1.5 fgsl_stderr()

```
type(fgsl_file) function fgsl_stderr
```

fgsl_stderr produces a fgsl_file object corresponding to C standard error

49.16.1.6 fgsl_stdin()

```
type(fgsl_file) function fgsl_stdin
```

fgsl_stdin produces a fgsl_file object corresponding to C standard input

49.16.1.7 fgsl_stdout()

```
type(fgsl_file) function fgsl_stdout
```

fgsl_stdout produces a fgsl_file object corresponding to C standard output

49.17 api/linalg.finc File Reference

Functions/Subroutines

- integer(fgsl_int) function fgsl_linalg_lu_decomp (a, p, signum)
- integer(fgsl_int) function fgsl_linalg_complex_lu_decomp (a, p, signum)
- integer(fgsl_int) function fgsl_linalg_lu_solve (lu, p, b, x)
- integer(fgsl_int) function fgsl_linalg_complex_lu_solve (lu, p, b, x)
- integer(fgsl_int) function fgsl_linalg_lu_svx (lu, p, x)
- integer(fgsl_int) function fgsl_linalg_complex_lu_svx (lu, p, x)
- integer(fgsl_int) function fgsl_linalg_lu_refine (a, lu, p, b, x, residual)
- integer(fgsl_int) function fgsl_linalg_complex_lu_refine (a, lu, p, b, x, residual)
- integer(fgsl_int) function fgsl_linalg_lu_invert (lu, p, inverse)
- integer(fgsl_int) function fgsl_linalg_complex_lu_invert (lu, p, inverse)
- real(fgsl_double) function fgsl_linalg_lu_det (lu, signum)
- complex(fgsl_double_complex) function fgsl_linalg_complex_lu_det (lu, signum)
- real(fgsl_double) function fgsl_linalg_lu_lndet (lu)
- real(fgsl_double) function fgsl_linalg_complex_lu_lndet (lu)
- integer(fgsl_int) function fgsl_linalg_lu_sgndet (lu, signum)
- complex(fgsl_double_complex) function fgsl_linalg_complex_lu_sgndet (lu, signum)
- integer(fgsl_int) function fgsl_linalg_qr_decomp (a, tau)
- integer(fgsl_int) function fgsl_linalg_qr_solve (qr, tau, b, x)
- integer(fgsl_int) function fgsl_linalg_qr_svx (qr, tau, x)
- integer(fgsl_int) function fgsl_linalg_qr_lssolve (qr, tau, b, x, residual)
- integer(fgsl_int) function fgsl_linalg_qr_qtvec (qr, tau, v)
- integer(fgsl_int) function fgsl_linalg_qr_qvec (qr, tau, v)
- integer(fgsl_int) function fgsl_linalg_qr_qtmat (qr, tau, a)
- integer(fgsl_int) function fgsl_linalg_qr_rsolve (qr, b, x)
- integer(fgsl_int) function fgsl_linalg_qr_rsvx (qr, x)
- integer(fgsl_int) function fgsl_linalg_qr_unpack (qr, tau, q, r)
- integer(fgsl_int) function fgsl_linalg_qr_qrsolve (q, r, b, x)
- integer(fgsl_int) function fgsl_linalg_qr_update (q, r, w, v)
- integer(fgsl_int) function fgsl_linalg_r_solve (r, b, x)
- integer(fgsl_int) function fgsl_linalg_r_svx (r, x)
- integer(fgsl_int) function fgsl_linalg_qrpt_decomp (a, tau, p, signum, norm)
- integer(fgsl_int) function fgsl_linalg_qrpt_decomp2 (a, q, r, tau, p, signum, norm)
- integer(fgsl_int) function fgsl_linalg_qrpt_solve (qr, tau, p, b, x)

- integer(fgsl_int) function fgsl_linalg_qrpt_svx (qr, tau, p, x)
- integer(fgsl_int) function fgsl_linalg_qrpt_lssolve (qr, tau, p, b, x, residual)
- integer(fgsl_int) function fgsl_linalg_qrpt_lssolve2 (qr, tau, p, b, rank, x, residual)
- integer(fgsl_int) function fgsl_linalg_qrpt_qrsolve (q, r, p, b, x)
- integer(fgsl_int) function fgsl_linalg_qrpt_update (q, r, p, w, v)
- integer(fgsl_int) function fgsl_linalg_qrpt_rsolve (qr, p, b, x)
- integer(fgsl_int) function fgsl_linalg_qrpt_rsvx (qr, p, x)
- integer(fgsl_size_t) function fgsl_linalg_qrpt_rank (qr, tol)
- integer(fgsl_int) function fgsl_linalg_qrpt_rcond (qr, rcond, work)
- integer(fgsl_int) function fgsl_linalg_cod_decomp (a, tau_q, tau_z, p, rank, work)
- integer(fgsl_int) function fgsl_linalg_cod_decomp_e (a, tau_q, tau_z, p, tol, rank, work)
- integer(fgsl_int) function fgsl_linalg_cod_lssolve (qrzt, tau_q, tau_z, p, rank, b, x, residual)
- integer(fgsl_int) function fgsl_linalg_cod_lssolve2 (lambda, qrzt, tau_q, tau_z, p, rank, b, x, residual, s, work)
- integer(fgsl_int) function fgsl_linalg_cod_unpack (qrzt, tau_q, tau_z, p, rank, q, r, z)
- integer(fgsl_int) function fgsl_linalg_cod_matz (qrzt, tau_z, rank, a, work)
- integer(fgsl_int) function fgsl_linalg_sv_decomp (a, v, s, work)
- integer(fgsl_int) function fgsl_linalg_sv_decomp_mod (a, x, v, s, work)
- integer(fgsl_int) function fgsl_linalg_sv_decomp_jacobi (a, v, s)
- integer(fgsl_int) function fgsl_linalg_sv_solve (u, v, s, b, x)
- integer(fgsl_int) function fgsl_linalg_sv_leverage (u, h)
- integer(fgsl_int) function fgsl_linalg_cholesky_decomp1 (a)
- integer(fgsl_int) function fgsl_linalg_cholesky_decomp (a)
- integer(fgsl_int) function fgsl_linalg_complex_cholesky_decomp (a)
- integer(fgsl_int) function fgsl_linalg_cholesky_solve (chol, b, x)
- integer(fgsl_int) function fgsl_linalg_complex_cholesky_solve (chol, b, x)
- integer(fgsl_int) function fgsl_linalg_cholesky_svx (chol, x)
- integer(fgsl_int) function fgsl_linalg_complex_cholesky_svx (chol, x)
- integer(fgsl_int) function fgsl_linalg_cholesky_decomp2 (a, s)
- integer(fgsl_int) function fgsl_linalg_cholesky_solve2 (chol, s, b, x)
- integer(fgsl_int) function fgsl_linalg_cholesky_svx2 (chol, s, x)
- integer(fgsl_int) function fgsl_linalg_cholesky_invert (chol)
- integer(fgsl_int) function fgsl_linalg_complex_cholesky_invert (chol)
- integer(fgsl_int) function fgsl_linalg_cholesky_scale (a, s)
- integer(fgsl_int) function fgsl_linalg_cholesky_scale_apply (a, s)
- integer(fgsl_int) function fgsl_linalg_cholesky_rcond (chol, rcond, work)
- integer(fgsl_int) function fgsl_linalg_pcholesky_decomp (a, p)
- integer(fgsl_int) function fgsl_linalg_pcholesky_solve (ldlt, p, b, x)
- integer(fgsl_int) function fgsl_linalg_pcholesky_svx (ldlt, p, x)
- integer(fgsl_int) function fgsl_linalg_pcholesky_decomp2 (a, p, s)
- integer(fgsl_int) function fgsl_linalg_pcholesky_solve2 (ldlt, p, s, b, x)
- integer(fgsl_int) function fgsl_linalg_pcholesky_svx2 (ldlt, p, s, x)
- integer(fgsl_int) function fgsl_linalg_pcholesky_invert (ldlt, p, ainv)
- integer(fgsl_int) function fgsl_linalg_pcholesky_rcond (ldlt, p, rcond, work)
- integer(fgsl_int) function fgsl_linalg_mcholesky_decomp (a, p, e)
- integer(fgsl_int) function fgsl_linalg_mcholesky_solve (ldlt, p, b, x)
- integer(fgsl_int) function fgsl_linalg_mcholesky_svx (ldlt, p, x)
- integer(fgsl_int) function fgsl_linalg_mcholesky_invert (ldlt, p, ainv)
- integer(fgsl_int) function fgsl_linalg_mcholesky_rcond (ldlt, p, rcond, work)
- integer(fgsl_int) function fgsl_linalg_symmtd_decomp (a, tau)
- integer(fgsl_int) function fgsl_linalg_symmtd_unpack (a, tau, q, diag, subdiag)
- integer(fgsl_int) function fgsl_linalg_symmtd_unpack_t (a, diag, subdiag)
- integer(fgsl_int) function fgsl_linalg_hermtd_decomp (a, tau)
- integer(fgsl_int) function fgsl_linalg_hermtd_unpack (a, tau, q, diag, subdiag)
- integer(fgsl_int) function fgsl_linalg_hermtd_unpack_t (a, diag, subdiag)
- integer(fgsl_int) function fgsl_linalg_hessenberg_decomp (a, tau)

- integer(fgsl_int) function fgsl_linalg_hessenberg_unpack (h, tau, u)
- integer(fgsl_int) function fgsl_linalg_hessenberg_unpack_accum (h, tau, v)
- integer(fgsl_int) function fgsl_linalg_hessenberg_set_zero (h)
- integer(fgsl_int) function fgsl_linalg_hesstri_decomp (a, b, u, v, work)
- integer(fgsl_int) function fgsl_linalg_bidiag_decomp (a, tau_u, tau_v)
- integer(fgsl_int) function fgsl_linalg_bidiag_unpack (a, tau_u, u, tau_v, v, diag, superdiag)
- integer(fgsl_int) function fgsl_linalg_bidiag_unpack2 (a, tau_u, tau_v, v)
- integer(fgsl_int) function fgsl_linalg_bidiag_unpack_b (a, diag, superdiag)
- real(fgsl_double) function fgsl_linalg_householder_transform (v)
- complex(fgsl_double_complex) function fgsl_linalg_complex_householder_transform (v)
- integer(fgsl_int) function fgsl_linalg_householder_hm (tau, v, a)
- integer(fgsl_int) function fgsl_linalg_complex_householder_hm (tau, v, a)
- integer(fgsl_int) function fgsl_linalg_householder_mh (tau, v, a)
- integer(fgsl_int) function fgsl_linalg_complex_householder_mh (tau, v, a)
- integer(fgsl_int) function fgsl_linalg_householder_hv (tau, v, w)
- integer(fgsl_int) function fgsl_linalg_complex_householder_hv (tau, v, w)
- integer(fgsl_int) function fgsl_linalg_hh_solve (a, b, x)
- integer(fgsl_int) function fgsl_linalg_hh_svx (a, x)
- integer(c_int) function fgsl_linalg_solve_tridiag (diag, e, f, b, x)
- integer(c_int) function fgsl_linalg_solve_symm_tridiag (diag, e, b, x)
- integer(c_int) function fgsl_linalg_solve_cyc_tridiag (diag, e, f, b, x)
- integer(c_int) function fgsl_linalg_solve_symm_cyc_tridiag (diag, e, b, x)
- integer(fgsl_int) function fgsl_linalg_balance_matrix (a, d)
- integer(fgsl_int) function fgsl_linalg_qr_matq (QR, tau, A)
- subroutine fgsl_linalg_givens (a, b, c, s)
- subroutine fgsl_linalg_givens_gv (v, i, j, c, s)
- integer(fgsl_int) function fgsl_linalg_tri_upper_invert (t)
- integer(fgsl_int) function fgsl_linalg_tri_lower_invert (t)
- integer(fgsl_int) function fgsl_linalg_tri_upper_unit_invert (t)
- integer(fgsl_int) function fgsl_linalg_tri_lower_unit_invert (t)
- integer(fgsl_int) function fgsl_linalg_tri_upper_rcond (t, rcond, work)
- integer(fgsl_int) function fgsl_linalg_tri_lower_rcond (t, rcond, work)

49.17.1 Function/Subroutine Documentation

49.17.1.1 fgsl_linalg_balance_matrix()

```
integer(fgsl_int) function fgsl_linalg_balance_matrix (
             type(fgsl_matrix), intent(inout) a,
             type(fgsl_vector), intent(inout) d )
```

49.17.1.2 fgsl_linalg_bidiag_decomp()

```
integer(fgsl_int) function fgsl_linalg_bidiag_decomp (
             type(fgsl_matrix), intent(inout) a,
             type(fgsl_vector), intent(inout) tau_u,
             type(fgsl_vector), intent(inout) tau_v )
```

49.17.1.3 fgsl_linalg_bidiag_unpack()

```
integer(fgsl_int) function fgsl_linalg_bidiag_unpack (
             type(fgsl_matrix), intent(in) a,
             type(fgsl_vector), intent(in) tau_u,
             type(fgsl_matrix), intent(inout) u,
             type(fgsl_vector), intent(in) tau_v,
             type(fgsl_matrix), intent(inout) v,
             type(fgsl_vector), intent(inout) diag,
             type(fgsl_vector), intent(inout) superdiag )
```

49.17.1.4 fgsl_linalg_bidiag_unpack2()

```
integer(fgsl_int) function fgsl_linalg_bidiag_unpack2 (
             type(fgsl_matrix), intent(inout) a,
             type(fgsl_vector), intent(in) tau_u,
             type(fgsl_vector), intent(in) tau_v,
             type(fgsl_matrix), intent(inout) v )
```

49.17.1.5 fgsl_linalg_bidiag_unpack_b()

```
integer(fgsl_int) function fgsl_linalg_bidiag_unpack_b (
             type(fgsl_matrix), intent(in) a,
             type(fgsl_vector), intent(inout) diag,
             type(fgsl_vector), intent(inout) superdiag )
```

49.17.1.6 fgsl_linalg_cholesky_decomp()

```
integer(fgsl_int) function fgsl_linalg_cholesky_decomp (
             type(fgsl_matrix), intent(inout) a )
```

49.17.1.7 fgsl_linalg_cholesky_decomp1()

```
integer(fgsl_int) function fgsl_linalg_cholesky_decomp1 (
             type(fgsl_matrix), intent(inout) a )
```

49.17.1.8 fgsl_linalg_cholesky_decomp2()

```
integer(fgsl_int) function fgsl_linalg_cholesky_decomp2 (
            type(fgsl_matrix), intent(inout) a,
            type(fgsl_vector), intent(inout) s )
```

49.17.1.9 fgsl_linalg_cholesky_invert()

```
integer(fgsl_int) function fgsl_linalg_cholesky_invert (
            type(fgsl_matrix), intent(inout) chol )
```

49.17.1.10 fgsl_linalg_cholesky_rcond()

```
integer(fgsl_int) function fgsl_linalg_cholesky_rcond (
            type(fgsl_matrix), intent(in) chol,
            real(fgsl_double), intent(inout) rcond,
            type(fgsl_vector), intent(inout) work )
```

49.17.1.11 fgsl_linalg_cholesky_scale()

```
integer(fgsl_int) function fgsl_linalg_cholesky_scale (
            type(fgsl_matrix), intent(in) a,
            type(fgsl_vector), intent(inout) s )
```

49.17.1.12 fgsl_linalg_cholesky_scale_apply()

```
integer(fgsl_int) function fgsl_linalg_cholesky_scale_apply (
            type(fgsl_matrix), intent(inout) a,
            type(fgsl_vector), intent(in) s )
```

49.17.1.13 fgsl_linalg_cholesky_solve()

```
integer(fgsl_int) function fgsl_linalg_cholesky_solve (
            type(fgsl_matrix), intent(in) chol,
            type(fgsl_vector), intent(in) b,
            type(fgsl_vector), intent(inout) x )
```

49.17.1.14 fgsl_linalg_cholesky_solve2()

```
integer(fgsl_int) function fgsl_linalg_cholesky_solve2 (
            type(fgsl_matrix), intent(in) chol,
            type(fgsl_vector), intent(in) s,
            type(fgsl_vector), intent(in) b,
            type(fgsl_vector), intent(inout) x )
```

49.17.1.15 fgsl_linalg_cholesky_svx()

```
integer(fgsl_int) function fgsl_linalg_cholesky_svx (
            type(fgsl_matrix), intent(in) chol,
            type(fgsl_vector), intent(inout) x )
```

49.17.1.16 fgsl_linalg_cholesky_svx2()

```
integer(fgsl_int) function fgsl_linalg_cholesky_svx2 (
            type(fgsl_matrix), intent(in) chol,
            type(fgsl_vector), intent(in) s,
            type(fgsl_vector), intent(inout) x )
```

49.17.1.17 fgsl_linalg_cod_decomp()

```
integer(fgsl_int) function fgsl_linalg_cod_decomp (
            type(fgsl_matrix), intent(inout) a,
            type(fgsl_vector), intent(inout) tau_q,
            type(fgsl_vector), intent(inout) tau_z,
            type(fgsl_permutation), intent(inout) p,
            integer(fgsl_size_t), intent(inout) rank,
            type(fgsl_vector), intent(inout) work )
```

49.17.1.18 fgsl_linalg_cod_decomp_e()

```
integer(fgsl_int) function fgsl_linalg_cod_decomp_e (
            type(fgsl_matrix), intent(inout) a,
            type(fgsl_vector), intent(inout) tau_q,
            type(fgsl_vector), intent(inout) tau_z,
            type(fgsl_permutation), intent(inout) p,
            real(fgsl_double), intent(in) tol,
            integer(fgsl_size_t), intent(inout) rank,
            type(fgsl_vector), intent(inout) work )
```

49.17.1.19 fgsl_linalg_cod_lssolve()

```
integer(fgsl_int) function fgsl_linalg_cod_lssolve (
             type(fgsl_matrix), intent(in) qrzt,
             type(fgsl_vector), intent(in) tau_q,
             type(fgsl_vector), intent(in) tau_z,
             type(fgsl_permutation), intent(in) p,
             integer(fgsl_size_t), intent(in) rank,
             type(fgsl_vector), intent(in) b,
             type(fgsl_vector), intent(inout) x,
             type(fgsl_vector), intent(inout) residual )
```

49.17.1.20 fgsl_linalg_cod_lssolve2()

```
integer(fgsl_int) function fgsl_linalg_cod_lssolve2 (
             real(fgsl_double), intent(in) lambda,
             type(fgsl_matrix), intent(in) qrzt,
             type(fgsl_vector), intent(in) tau_q,
             type(fgsl_vector), intent(in) tau_z,
             type(fgsl_permutation), intent(in) p,
             integer(fgsl_size_t), intent(in) rank,
             type(fgsl_vector), intent(in) b,
             type(fgsl_vector), intent(inout) x,
             type(fgsl_vector), intent(inout) residual,
             type(fgsl_matrix), intent(inout) s,
             type(fgsl_vector), intent(inout) work )
```

49.17.1.21 fgsl_linalg_cod_matz()

```
integer(fgsl_int) function fgsl_linalg_cod_matz (
             type(fgsl_matrix), intent(in) qrzt,
             type(fgsl_vector), intent(in) tau_z,
             integer(fgsl_size_t), intent(in) rank,
             type(fgsl_matrix), intent(inout) a,
             type(fgsl_vector), intent(inout) work )
```

49.17.1.22 fgsl_linalg_cod_unpack()

```
integer(fgsl_int) function fgsl_linalg_cod_unpack (
             type(fgsl_matrix), intent(in) qrzt,
             type(fgsl_vector), intent(in) tau_q,
             type(fgsl_vector), intent(in) tau_z,
             type(fgsl_permutation), intent(in) p,
             integer(fgsl_size_t), intent(in) rank,
             type(fgsl_matrix), intent(inout) q,
             type(fgsl_matrix), intent(inout) r,
             type(fgsl_matrix), intent(inout) z )
```

49.17.1.23 fgsl_linalg_complex_cholesky_decomp()

```
integer(fgsl_int) function fgsl_linalg_complex_cholesky_decomp (
            type(fgsl_matrix_complex), intent(inout) a )
```

49.17.1.24 fgsl_linalg_complex_cholesky_invert()

```
integer(fgsl_int) function fgsl_linalg_complex_cholesky_invert (
            type(fgsl_matrix_complex), intent(inout) chol )
```

49.17.1.25 fgsl_linalg_complex_cholesky_solve()

```
integer(fgsl_int) function fgsl_linalg_complex_cholesky_solve (
            type(fgsl_matrix_complex), intent(in) chol,
            type(fgsl_vector_complex), intent(in) b,
            type(fgsl_vector_complex), intent(inout) x )
```

49.17.1.26 fgsl_linalg_complex_cholesky_svx()

```
integer(fgsl_int) function fgsl_linalg_complex_cholesky_svx (
            type(fgsl_matrix_complex), intent(in) chol,
            type(fgsl_vector_complex), intent(inout) x )
```

49.17.1.27 fgsl_linalg_complex_householder_hm()

```
integer(fgsl_int) function fgsl_linalg_complex_householder_hm (
            complex(fgsl_double_complex), intent(in) tau,
            type(fgsl_vector_complex), intent(in) v,
            type(fgsl_matrix_complex), intent(inout) a )
```

49.17.1.28 fgsl_linalg_complex_householder_hv()

```
integer(fgsl_int) function fgsl_linalg_complex_householder_hv (
            complex(fgsl_double_complex), intent(in) tau,
            type(fgsl_vector_complex), intent(in) v,
            type(fgsl_vector_complex), intent(inout) w )
```

49.17.1.29 fgsl_linalg_complex_householder_mh()

```
integer(fgsl_int) function fgsl_linalg_complex_householder_mh (
             complex(fgsl_double_complex), intent(in) tau,
             type(fgsl_vector_complex), intent(in) v,
             type(fgsl_matrix_complex), intent(inout) a )
```

49.17.1.30 fgsl_linalg_complex_householder_transform()

```
complex(fgsl_double_complex) function fgsl_linalg_complex_householder_transform (
             type(fgsl_vector), intent(inout) v )
```

49.17.1.31 fgsl_linalg_complex_lu_decomp()

```
integer(fgsl_int) function fgsl_linalg_complex_lu_decomp (
             type(fgsl_matrix_complex) a,
             type(fgsl_permutation) p,
             integer(fgsl_int) signum )
```

49.17.1.32 fgsl_linalg_complex_lu_det()

```
complex(fgsl_double_complex) function fgsl_linalg_complex_lu_det (
             type(fgsl_matrix_complex), intent(in) lu,
             integer(fgsl_int), intent(in) signum )
```

49.17.1.33 fgsl_linalg_complex_lu_invert()

```
integer(fgsl_int) function fgsl_linalg_complex_lu_invert (
             type(fgsl_matrix_complex), intent(in) lu,
             type(fgsl_permutation), intent(in) p,
             type(fgsl_matrix_complex), intent(inout) inverse )
```

49.17.1.34 fgsl_linalg_complex_lu_lndet()

```
real(fgsl_double) function fgsl_linalg_complex_lu_lndet (
             type(fgsl_matrix_complex), intent(in) lu )
```

49.17.1.35 fgsl_linalg_complex_lu_refine()

```
integer(fgsl_int) function fgsl_linalg_complex_lu_refine (
             type(fgsl_matrix_complex), intent(in) a,
             type(fgsl_matrix_complex), intent(in) lu,
             type(fgsl_permutation), intent(in) p,
             type(fgsl_vector_complex), intent(in) b,
             type(fgsl_vector_complex), intent(inout) x,
             type(fgsl_vector_complex), intent(inout) residual )
```

49.17.1.36 fgsl_linalg_complex_lu_sgndet()

```
complex(fgsl_double_complex) function fgsl_linalg_complex_lu_sgndet (
             type(fgsl_matrix_complex), intent(in) lu,
             integer(fgsl_int), intent(in) signum )
```

49.17.1.37 fgsl_linalg_complex_lu_solve()

```
integer(fgsl_int) function fgsl_linalg_complex_lu_solve (
             type(fgsl_matrix_complex), intent(in) lu,
             type(fgsl_permutation), intent(in) p,
             type(fgsl_vector_complex), intent(in) b,
             type(fgsl_vector_complex), intent(inout) x )
```

49.17.1.38 fgsl_linalg_complex_lu_svx()

```
integer(fgsl_int) function fgsl_linalg_complex_lu_svx (
             type(fgsl_matrix_complex), intent(in) lu,
             type(fgsl_permutation), intent(in) p,
             type(fgsl_vector_complex), intent(inout) x )
```

49.17.1.39 fgsl_linalg_givens()

```
subroutine fgsl_linalg_givens (
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b,
             real(fgsl_double), intent(out) c,
             real(fgsl_double), intent(out) s )
```

49.17.1.40 fgsl_linalg_givens_gv()

```
subroutine fgsl_linalg_givens_gv (
             type(fgsl_vector), intent(inout) v,
             integer(fgsl_size_t), intent(in) i,
             integer(fgsl_size_t), intent(in) j,
             real(fgsl_double), intent(in) c,
             real(fgsl_double), intent(in) s )
```

49.17.1.41 fgsl_linalg_hermtd_decomp()

```
integer(fgsl_int) function fgsl_linalg_hermtd_decomp (
             type(fgsl_matrix_complex), intent(inout) a,
             type(fgsl_vector_complex), intent(inout) tau )
```

49.17.1.42 fgsl_linalg_hermtd_unpack()

```
integer(fgsl_int) function fgsl_linalg_hermtd_unpack (
             type(fgsl_matrix_complex), intent(in) a,
             type(fgsl_vector_complex), intent(in) tau,
             type(fgsl_matrix_complex), intent(inout) q,
             type(fgsl_vector), intent(inout) diag,
             type(fgsl_vector), intent(inout) subdiag )
```

49.17.1.43 fgsl_linalg_hermtd_unpack_t()

```
integer(fgsl_int) function fgsl_linalg_hermtd_unpack_t (
             type(fgsl_matrix_complex), intent(in) a,
             type(fgsl_vector), intent(inout) diag,
             type(fgsl_vector), intent(inout) subdiag )
```

49.17.1.44 fgsl_linalg_hessenberg_decomp()

```
integer(fgsl_int) function fgsl_linalg_hessenberg_decomp (
             type(fgsl_matrix), intent(inout) a,
             type(fgsl_vector), intent(inout) tau )
```

49.17.1.45 fgsl_linalg_hessenberg_set_zero()

```
integer(fgsl_int) function fgsl_linalg_hessenberg_set_zero (
             type(fgsl_matrix), intent(inout) h )
```

49.17.1.46 fgsl_linalg_hessenberg_unpack()

```
integer(fgsl_int) function fgsl_linalg_hessenberg_unpack (
             type(fgsl_matrix), intent(in) h,
             type(fgsl_vector), intent(in) tau,
             type(fgsl_matrix), intent(inout) u )
```

49.17.1.47 fgsl_linalg_hessenberg_unpack_accum()

```
integer(fgsl_int) function fgsl_linalg_hessenberg_unpack_accum (
             type(fgsl_matrix), intent(in) h,
             type(fgsl_vector), intent(in) tau,
             type(fgsl_matrix), intent(inout) v )
```

49.17.1.48 fgsl_linalg_hesstri_decomp()

```
integer(fgsl_int) function fgsl_linalg_hesstri_decomp (
             type(fgsl_matrix), intent(inout) a,
             type(fgsl_matrix), intent(inout) b,
             type(fgsl_matrix), intent(inout) u,
             type(fgsl_matrix), intent(inout) v,
             type(fgsl_vector), intent(inout) work )
```

49.17.1.49 fgsl_linalg_hh_solve()

```
integer(fgsl_int) function fgsl_linalg_hh_solve (
             type(fgsl_matrix), intent(inout) a,
             type(fgsl_vector), intent(in) b,
             type(fgsl_vector), intent(inout) x )
```

49.17.1.50 fgsl_linalg_hh_svx()

```
integer(fgsl_int) function fgsl_linalg_hh_svx (
             type(fgsl_matrix), intent(inout) a,
             type(fgsl_vector), intent(inout) x )
```

49.17.1.51 fgsl_linalg_householder_hm()

```
integer(fgsl_int) function fgsl_linalg_householder_hm (
             real(fgsl_double), intent(in) tau,
             type(fgsl_vector), intent(in) v,
             type(fgsl_matrix), intent(inout) a )
```

49.17.1.52 fgsl_linalg_householder_hv()

```
integer(fgsl_int) function fgsl_linalg_householder_hv (
             real(fgsl_double), intent(in) tau,
             type(fgsl_vector), intent(in) v,
             type(fgsl_vector), intent(inout) w )
```

49.17.1.53 fgsl_linalg_householder_mh()

```
integer(fgsl_int) function fgsl_linalg_householder_mh (
             real(fgsl_double), intent(in) tau,
             type(fgsl_vector), intent(in) v,
             type(fgsl_matrix), intent(inout) a )
```

49.17.1.54 fgsl_linalg_householder_transform()

```
real(fgsl_double) function fgsl_linalg_householder_transform (
             type(fgsl_vector), intent(inout) v )
```

49.17.1.55 fgsl_linalg_lu_decomp()

```
integer(fgsl_int) function fgsl_linalg_lu_decomp (
             type(fgsl_matrix) a,
             type(fgsl_permutation) p,
             integer(fgsl_int) signum )
```

49.17.1.56 fgsl_linalg_lu_det()

```
real(fgsl_double) function fgsl_linalg_lu_det (
             type(fgsl_matrix), intent(in) lu,
             integer(fgsl_int), intent(in) signum )
```

49.17.1.57 fgsl_linalg_lu_invert()

```
integer(fgsl_int) function fgsl_linalg_lu_invert (
             type(fgsl_matrix), intent(in) lu,
             type(fgsl_permutation), intent(in) p,
             type(fgsl_matrix), intent(inout) inverse )
```

49.17.1.58 fgsl_linalg_lu_lndet()

```
real(fgsl_double) function fgsl_linalg_lu_lndet (
             type(fgsl_matrix), intent(in) lu )
```

49.17.1.59 fgsl_linalg_lu_refine()

```
integer(fgsl_int) function fgsl_linalg_lu_refine (
             type(fgsl_matrix), intent(in) a,
             type(fgsl_matrix), intent(in) lu,
             type(fgsl_permutation), intent(in) p,
             type(fgsl_vector), intent(in) b,
             type(fgsl_vector), intent(inout) x,
             type(fgsl_vector), intent(inout) residual )
```

49.17.1.60 fgsl_linalg_lu_sgndet()

```
integer(fgsl_int) function fgsl_linalg_lu_sgndet (
             type(fgsl_matrix), intent(in) lu,
             integer(fgsl_int), intent(in) signum )
```

49.17.1.61 fgsl_linalg_lu_solve()

```
integer(fgsl_int) function fgsl_linalg_lu_solve (
             type(fgsl_matrix), intent(in) lu,
             type(fgsl_permutation), intent(in) p,
             type(fgsl_vector), intent(in) b,
             type(fgsl_vector), intent(inout) x )
```

49.17.1.62 fgsl_linalg_lu_svx()

```
integer(fgsl_int) function fgsl_linalg_lu_svx (
             type(fgsl_matrix), intent(in) lu,
             type(fgsl_permutation), intent(in) p,
             type(fgsl_vector), intent(inout) x )
```

49.17.1.63 fgsl_linalg_mcholesky_decomp()

```
integer(fgsl_int) function fgsl_linalg_mcholesky_decomp (
             type(fgsl_matrix), intent(inout) a,
             type(fgsl_permutation), intent(inout) p,
             type(fgsl_vector), intent(inout) e )
```

49.17.1.64 fgsl_linalg_mcholesky_invert()

```
integer(fgsl_int) function fgsl_linalg_mcholesky_invert (
             type(fgsl_matrix), intent(in) ldlt,
             type(fgsl_permutation), intent(in) p,
             type(fgsl_matrix), intent(inout) ainv )
```

49.17.1.65 fgsl_linalg_mcholesky_rcond()

```
integer(fgsl_int) function fgsl_linalg_mcholesky_rcond (
             type(fgsl_matrix), intent(in) ldlt,
             type(fgsl_permutation), intent(in) p,
             real(fgsl_double), intent(inout) rcond,
             type(fgsl_vector), intent(inout) work )
```

49.17.1.66 fgsl_linalg_mcholesky_solve()

```
integer(fgsl_int) function fgsl_linalg_mcholesky_solve (
             type(fgsl_matrix), intent(in) ldlt,
             type(fgsl_permutation), intent(in) p,
             type(fgsl_vector), intent(in) b,
             type(fgsl_vector), intent(inout) x )
```

49.17.1.67 fgsl_linalg_mcholesky_svx()

```
integer(fgsl_int) function fgsl_linalg_mcholesky_svx (
            type(fgsl_matrix), intent(in) ldlt,
            type(fgsl_permutation), intent(in) p,
            type(fgsl_vector), intent(inout) x )
```

49.17.1.68 fgsl_linalg_pcholesky_decomp()

```
integer(fgsl_int) function fgsl_linalg_pcholesky_decomp (
            type(fgsl_matrix), intent(inout) a,
            type(fgsl_permutation), intent(inout) p )
```

49.17.1.69 fgsl_linalg_pcholesky_decomp2()

```
integer(fgsl_int) function fgsl_linalg_pcholesky_decomp2 (
            type(fgsl_matrix), intent(inout) a,
            type(fgsl_permutation), intent(inout) p,
            type(fgsl_vector), intent(inout) s )
```

49.17.1.70 fgsl_linalg_pcholesky_invert()

```
integer(fgsl_int) function fgsl_linalg_pcholesky_invert (
            type(fgsl_matrix), intent(in) ldlt,
            type(fgsl_permutation), intent(in) p,
            type(fgsl_matrix), intent(inout) ainv )
```

49.17.1.71 fgsl_linalg_pcholesky_rcond()

```
integer(fgsl_int) function fgsl_linalg_pcholesky_rcond (
            type(fgsl_matrix), intent(in) ldlt,
            type(fgsl_permutation), intent(in) p,
            real(fgsl_double), intent(inout) rcond,
            type(fgsl_vector), intent(inout) work )
```

49.17.1.72 fgsl_linalg_pcholesky_solve()

```
integer(fgsl_int) function fgsl_linalg_pcholesky_solve (
             type(fgsl_matrix), intent(in) ldlt,
             type(fgsl_permutation), intent(in) p,
             type(fgsl_vector), intent(in) b,
             type(fgsl_vector), intent(inout) x )
```

49.17.1.73 fgsl_linalg_pcholesky_solve2()

```
integer(fgsl_int) function fgsl_linalg_pcholesky_solve2 (
             type(fgsl_matrix), intent(in) ldlt,
             type(fgsl_permutation), intent(in) p,
             type(fgsl_vector), intent(in) s,
             type(fgsl_vector), intent(in) b,
             type(fgsl_vector), intent(inout) x )
```

49.17.1.74 fgsl_linalg_pcholesky_svx()

```
integer(fgsl_int) function fgsl_linalg_pcholesky_svx (
             type(fgsl_matrix), intent(in) ldlt,
             type(fgsl_permutation), intent(in) p,
             type(fgsl_vector), intent(inout) x )
```

49.17.1.75 fgsl_linalg_pcholesky_svx2()

```
integer(fgsl_int) function fgsl_linalg_pcholesky_svx2 (
             type(fgsl_matrix), intent(in) ldlt,
             type(fgsl_permutation), intent(in) p,
             type(fgsl_vector), intent(in) s,
             type(fgsl_vector), intent(inout) x )
```

49.17.1.76 fgsl_linalg_qr_decomp()

```
integer(fgsl_int) function fgsl_linalg_qr_decomp (
             type(fgsl_matrix), intent(inout) a,
             type(fgsl_vector), intent(inout) tau )
```

49.17.1.77 fgsl_linalg_qr_lssolve()

```
integer(fgsl_int) function fgsl_linalg_qr_lssolve (
             type(fgsl_matrix), intent(in) qr,
             type(fgsl_vector), intent(in) tau,
             type(fgsl_vector), intent(in) b,
             type(fgsl_vector), intent(inout) x,
             type(fgsl_vector), intent(inout) residual )
```

49.17.1.78 fgsl_linalg_qr_matq()

```
integer(fgsl_int) function fgsl_linalg_qr_matq (
             type(fgsl_matrix), intent(in) QR,
             type(fgsl_vector), intent(in) tau,
             type(fgsl_matrix), intent(inout) A )
```

49.17.1.79 fgsl_linalg_qr_qrsolve()

```
integer(fgsl_int) function fgsl_linalg_qr_qrsolve (
             type(fgsl_matrix), intent(in) q,
             type(fgsl_matrix), intent(in) r,
             type(fgsl_vector), intent(in) b,
             type(fgsl_vector), intent(inout) x )
```

49.17.1.80 fgsl_linalg_qr_qtmat()

```
integer(fgsl_int) function fgsl_linalg_qr_qtmat (
             type(fgsl_matrix), intent(in) qr,
             type(fgsl_vector), intent(in) tau,
             type(fgsl_matrix), intent(inout) a )
```

49.17.1.81 fgsl_linalg_qr_qtvec()

```
integer(fgsl_int) function fgsl_linalg_qr_qtvec (
             type(fgsl_matrix), intent(in) qr,
             type(fgsl_vector), intent(in) tau,
             type(fgsl_vector), intent(inout) v )
```

49.17.1.82 fgsl_linalg_qr_qvec()

```
integer(fgsl_int) function fgsl_linalg_qr_qvec (
             type(fgsl_matrix), intent(in) qr,
             type(fgsl_vector), intent(in) tau,
             type(fgsl_vector), intent(inout) v )
```

49.17.1.83 fgsl_linalg_qr_rsolve()

```
integer(fgsl_int) function fgsl_linalg_qr_rsolve (
             type(fgsl_matrix), intent(in) qr,
             type(fgsl_vector), intent(in) b,
             type(fgsl_vector), intent(inout) x )
```

49.17.1.84 fgsl_linalg_qr_rsvx()

```
integer(fgsl_int) function fgsl_linalg_qr_rsvx (
             type(fgsl_matrix), intent(in) qr,
             type(fgsl_vector), intent(inout) x )
```

49.17.1.85 fgsl_linalg_qr_solve()

```
integer(fgsl_int) function fgsl_linalg_qr_solve (
             type(fgsl_matrix), intent(in) qr,
             type(fgsl_vector), intent(in) tau,
             type(fgsl_vector), intent(in) b,
             type(fgsl_vector), intent(inout) x )
```

49.17.1.86 fgsl_linalg_qr_svx()

```
integer(fgsl_int) function fgsl_linalg_qr_svx (
             type(fgsl_matrix), intent(in) qr,
             type(fgsl_vector), intent(in) tau,
             type(fgsl_vector), intent(inout) x )
```

49.17.1.87 fgsl_linalg_qr_unpack()

```
integer(fgsl_int) function fgsl_linalg_qr_unpack (
             type(fgsl_matrix), intent(in) qr,
             type(fgsl_vector), intent(in) tau,
             type(fgsl_matrix), intent(inout) q,
             type(fgsl_matrix), intent(inout) r )
```

49.17.1.88 fgsl_linalg_qr_update()

```
integer(fgsl_int) function fgsl_linalg_qr_update (
             type(fgsl_matrix), intent(inout) q,
             type(fgsl_matrix), intent(inout) r,
             type(fgsl_vector), intent(inout) w,
             type(fgsl_vector), intent(in) v )
```

49.17.1.89 fgsl_linalg_qrpt_decomp()

```
integer(fgsl_int) function fgsl_linalg_qrpt_decomp (
             type(fgsl_matrix), intent(inout) a,
             type(fgsl_vector), intent(inout) tau,
             type(fgsl_permutation), intent(inout) p,
             integer(fgsl_int), intent(out) signum,
             type(fgsl_vector), intent(inout) norm )
```

49.17.1.90 fgsl_linalg_qrpt_decomp2()

```
integer(fgsl_int) function fgsl_linalg_qrpt_decomp2 (
             type(fgsl_matrix), intent(in) a,
             type(fgsl_matrix), intent(inout) q,
             type(fgsl_matrix), intent(inout) r,
             type(fgsl_vector), intent(inout) tau,
             type(fgsl_permutation), intent(inout) p,
             integer(fgsl_int), intent(out) signum,
             type(fgsl_vector), intent(inout) norm )
```

49.17.1.91 fgsl_linalg_qrpt_lssolve()

```
integer(fgsl_int) function fgsl_linalg_qrpt_lssolve (
             type(fgsl_matrix), intent(in) qr,
             type(fgsl_vector), intent(in) tau,
             type(fgsl_permutation), intent(in) p,
             type(fgsl_vector), intent(in) b,
             type(fgsl_vector), intent(inout) x,
             type(fgsl_vector), intent(inout) residual )
```

49.17.1.92 fgsl_linalg_qrpt_lssolve2()

```
integer(fgsl_int) function fgsl_linalg_qrpt_lssolve2 (
             type(fgsl_matrix), intent(in) qr,
             type(fgsl_vector), intent(in) tau,
             type(fgsl_permutation), intent(in) p,
             type(fgsl_vector), intent(in) b,
             integer(fgsl_size_t), intent(in) rank,
             type(fgsl_vector), intent(inout) x,
             type(fgsl_vector), intent(inout) residual )
```

49.17.1.93 fgsl_linalg_qrpt_qrsolve()

```
integer(fgsl_int) function fgsl_linalg_qrpt_qrsolve (
             type(fgsl_matrix), intent(in) q,
             type(fgsl_matrix), intent(in) r,
             type(fgsl_permutation), intent(in) p,
             type(fgsl_vector), intent(in) b,
             type(fgsl_vector), intent(inout) x )
```

49.17.1.94 fgsl_linalg_qrpt_rank()

```
integer(fgsl_size_t) function fgsl_linalg_qrpt_rank (
             type(fgsl_matrix), intent(in) qr,
             real(fgsl_double), intent(in) tol )
```

49.17.1.95 fgsl_linalg_qrpt_rcond()

```
integer(fgsl_int) function fgsl_linalg_qrpt_rcond (
             type(fgsl_matrix), intent(in) qr,
             real(fgsl_double), intent(inout) rcond,
             type(fgsl_vector), intent(inout) work )
```

49.17.1.96 fgsl_linalg_qrpt_rsolve()

```
integer(fgsl_int) function fgsl_linalg_qrpt_rsolve (
             type(fgsl_matrix), intent(in) qr,
             type(fgsl_permutation), intent(in) p,
             type(fgsl_vector), intent(in) b,
             type(fgsl_vector), intent(inout) x )
```

49.17.1.97 fgsl_linalg_qrpt_rsvx()

```
integer(fgsl_int) function fgsl_linalg_qrpt_rsvx (
             type(fgsl_matrix), intent(in) qr,
             type(fgsl_permutation), intent(in) p,
             type(fgsl_vector), intent(inout) x )
```

49.17.1.98 fgsl_linalg_qrpt_solve()

```
integer(fgsl_int) function fgsl_linalg_qrpt_solve (
             type(fgsl_matrix), intent(in) qr,
             type(fgsl_vector), intent(in) tau,
             type(fgsl_permutation), intent(in) p,
             type(fgsl_vector), intent(in) b,
             type(fgsl_vector), intent(inout) x )
```

49.17.1.99 fgsl_linalg_qrpt_svx()

```
integer(fgsl_int) function fgsl_linalg_qrpt_svx (
             type(fgsl_matrix), intent(in) qr,
             type(fgsl_vector), intent(in) tau,
             type(fgsl_permutation), intent(in) p,
             type(fgsl_vector), intent(inout) x )
```

49.17.1.100 fgsl_linalg_qrpt_update()

```
integer(fgsl_int) function fgsl_linalg_qrpt_update (
             type(fgsl_matrix), intent(inout) q,
             type(fgsl_matrix), intent(inout) r,
             type(fgsl_permutation), intent(in) p,
             type(fgsl_vector), intent(inout) w,
             type(fgsl_vector), intent(in) v )
```

49.17.1.101 fgsl_linalg_r_solve()

```
integer(fgsl_int) function fgsl_linalg_r_solve (
             type(fgsl_matrix), intent(in) r,
             type(fgsl_vector), intent(in) b,
             type(fgsl_vector), intent(inout) x )
```

49.17.1.102 fgsl_linalg_r_svx()

```
integer(fgsl_int) function fgsl_linalg_r_svx (
             type(fgsl_matrix), intent(in) r,
             type(fgsl_vector), intent(inout) x )
```

49.17.1.103 fgsl_linalg_solve_cyc_tridiag()

```
integer(c_int) function fgsl_linalg_solve_cyc_tridiag (
             type(fgsl_vector), intent(in) diag,
             type(fgsl_vector), intent(in) e,
             type(fgsl_vector), intent(in) f,
             type(fgsl_vector), intent(in) b,
             type(fgsl_vector), intent(inout) x )
```

49.17.1.104 fgsl_linalg_solve_symm_cyc_tridiag()

```
integer(c_int) function fgsl_linalg_solve_symm_cyc_tridiag (
             type(fgsl_vector), intent(in) diag,
             type(fgsl_vector), intent(in) e,
             type(fgsl_vector), intent(in) b,
             type(fgsl_vector), intent(inout) x )
```

49.17.1.105 fgsl_linalg_solve_symm_tridiag()

```
integer(c_int) function fgsl_linalg_solve_symm_tridiag (
             type(fgsl_vector), intent(in) diag,
             type(fgsl_vector), intent(in) e,
             type(fgsl_vector), intent(in) b,
             type(fgsl_vector), intent(inout) x )
```

49.17.1.106 fgsl_linalg_solve_tridiag()

```
integer(c_int) function fgsl_linalg_solve_tridiag (
             type(fgsl_vector), intent(in) diag,
             type(fgsl_vector), intent(in) e,
             type(fgsl_vector), intent(in) f,
             type(fgsl_vector), intent(in) b,
             type(fgsl_vector), intent(inout) x )
```

49.17.1.107 fgsl_linalg_sv_decomp()

```
integer(fgsl_int) function fgsl_linalg_sv_decomp (
             type(fgsl_matrix), intent(inout) a,
             type(fgsl_matrix), intent(inout) v,
             type(fgsl_vector), intent(inout) s,
             type(fgsl_vector), intent(inout) work )
```

49.17.1.108 fgsl_linalg_sv_decomp_jacobi()

```
integer(fgsl_int) function fgsl_linalg_sv_decomp_jacobi (
             type(fgsl_matrix), intent(inout) a,
             type(fgsl_matrix), intent(inout) v,
             type(fgsl_vector), intent(inout) s )
```

49.17.1.109 fgsl_linalg_sv_decomp_mod()

```
integer(fgsl_int) function fgsl_linalg_sv_decomp_mod (
             type(fgsl_matrix), intent(inout) a,
             type(fgsl_matrix), intent(inout) x,
             type(fgsl_matrix), intent(inout) v,
             type(fgsl_vector), intent(inout) s,
             type(fgsl_vector), intent(inout) work )
```

49.17.1.110 fgsl_linalg_sv_leverage()

```
integer(fgsl_int) function fgsl_linalg_sv_leverage (
             type(fgsl_matrix), intent(in) u,
             type(fgsl_vector), intent(inout) h )
```

49.17.1.111 fgsl_linalg_sv_solve()

```
integer(fgsl_int) function fgsl_linalg_sv_solve (
             type(fgsl_matrix), intent(in) u,
             type(fgsl_matrix), intent(in) v,
             type(fgsl_vector), intent(in) s,
             type(fgsl_vector), intent(in) b,
             type(fgsl_vector), intent(inout) x )
```

49.17.1.112 fgsl_linalg_symmtd_decomp()

```
integer(fgsl_int) function fgsl_linalg_symmtd_decomp (
             type(fgsl_matrix), intent(inout) a,
             type(fgsl_vector), intent(inout) tau )
```

49.17.1.113 fgsl_linalg_symmtd_unpack()

```
integer(fgsl_int) function fgsl_linalg_symmtd_unpack (
             type(fgsl_matrix), intent(in) a,
             type(fgsl_vector), intent(in) tau,
             type(fgsl_matrix), intent(inout) q,
             type(fgsl_vector), intent(inout) diag,
             type(fgsl_vector), intent(inout) subdiag )
```

49.17.1.114 fgsl_linalg_symmtd_unpack_t()

```
integer(fgsl_int) function fgsl_linalg_symmtd_unpack_t (
             type(fgsl_matrix), intent(in) a,
             type(fgsl_vector), intent(inout) diag,
             type(fgsl_vector), intent(inout) subdiag )
```

49.17.1.115 fgsl_linalg_tri_lower_invert()

```
integer(fgsl_int) function fgsl_linalg_tri_lower_invert (
             type(fgsl_matrix), intent(inout) t )
```

49.17.1.116 fgsl_linalg_tri_lower_rcond()

```
integer(fgsl_int) function fgsl_linalg_tri_lower_rcond (
             type(fgsl_matrix), intent(inout) t,
             real(fgsl_double), intent(inout) rcond,
             type(fgsl_vector), intent(inout) work )
```

49.17.1.117 fgsl_linalg_tri_lower_unit_invert()

```
integer(fgsl_int) function fgsl_linalg_tri_lower_unit_invert (
             type(fgsl_matrix), intent(inout) t )
```

49.17.1.118 fgsl_linalg_tri_upper_invert()

```
integer(fgsl_int) function fgsl_linalg_tri_upper_invert (
             type(fgsl_matrix), intent(inout) t )
```

49.17.1.119 fgsl_linalg_tri_upper_rcond()

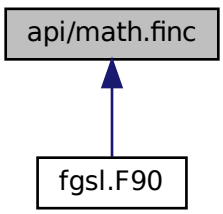
```
integer(fgsl_int) function fgsl_linalg_tri_upper_rcond (
             type(fgsl_matrix), intent(inout) t,
             real(fgsl_double), intent(inout) rcond,
             type(fgsl_vector), intent(inout) work )
```

49.17.1.120 fgsl_linalg_tri_upper_unit_invert()

```
integer(fgsl_int) function fgsl_linalg_tri_upper_unit_invert (
             type(fgsl_matrix), intent(inout) t )
```

49.18 api/math.finc File Reference

This graph shows which files directly or indirectly include this file:



Functions/Subroutines

- integer(fgsl_int) function fgsl_isnan (x)
- integer(fgsl_int) function fgsl_isinf (x)
- integer(fgsl_int) function fgsl_finite (x)
- real(fgsl_double) function fgsl_log1p (x)
- real(fgsl_double) function fgsl_expm1 (x)
- real(fgsl_double) function fgsl_acosh (x)
- real(fgsl_double) function fgsl_asinh (x)
- real(fgsl_double) function fgsl_atanh (x)

- real(fgsl_double) function fgsl_ldexp (x, e)
- real(fgsl_double) function fgsl_frexp (x, e)
- integer(fgsl_int) function fgsl_fcmp (x, y, eps)
- type(fgsl_function) function fgsl_function_init (func, params)

  Constructor for an FGSL function type.
- type(fgsl_function_fdf) function fgsl_function_fdf_init (f, df, fdf, params)

  Constructor for an FGSL function type including a derivative.
- subroutine fgsl_function_free (sfunc)

  Free resources associated with a FGSL function object.
- subroutine fgsl_function_fdf_free (sfunc)

  Free resources associated with a FGSL function with derivative object.
- real(fgsl_double) function fgsl_fn_eval (sfunc, x)

  Evaluate a function value for a FGSL function object.
- real(fgsl_double) function fgsl_fn_fdf_eval_f (sfunc, x)

  Evaluate a function value for a FGSL function with derivative object.
- real(fgsl_double) function fgsl_fn_fdf_eval_df (sfunc, x)

  Evaluate a derivative value for a FGSL function with derivative object.
- subroutine fgsl_fn_fdf_eval_f_df (sfunc, x, y, dy)

  Evaluate function as well as derivative value for a FGSL function with derivative object.

49.18.1 Function/Subroutine Documentation

49.18.1.1 fgsl_acosh()

```
real(fgsl_double) function fgsl_acosh (
             real(fgsl_double), intent(in) x )
```

49.18.1.2 fgsl_asinh()

```
real(fgsl_double) function fgsl_asinh (
             real(fgsl_double), intent(in) x )
```

49.18.1.3 fgsl_atanh()

```
real(fgsl_double) function fgsl_atanh (
             real(fgsl_double), intent(in) x )
```

49.18.1.4 fgsl_expm1()

```
real(fgsl_double) function fgsl_expm1 (
             real(fgsl_double), intent(in) x )
```

49.18.1.5 fgsl_fcmp()

```
integer(fgsl_int) function fgsl_fcmp (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             real(fgsl_double), intent(in) eps )
```

49.18.1.6 fgsl_finite()

```
integer(fgsl_int) function fgsl_finite (
             real(fgsl_double), intent(in) x )
```

49.18.1.7 fgsl_fn_eval()

```
real(fgsl_double) function fgsl_fn_eval (
             type(fgsl_function), intent(inout) sfunc,
             real(fgsl_double), intent(in) x )
```

Evaluate a function value for a FGSL function object.

Parameters

sfunc	- function object.
x	- argument value

Returns

Function value

49.18.1.8 fgsl_fn_fdf_eval_df()

```
real(fgsl_double) function fgsl_fn_fdf_eval_df (
             type(fgsl_function_fdf), intent(inout) sfunc,
             real(fgsl_double), intent(in) x )
```

Evaluate a derivative value for a FGSL function with derivative object.

Parameters

sfunc	- function with derivative object.
x	- argument value

Returns

Derivative value

49.18.1.9 fgsl_fn_fdf_eval_f()

```
real(fgsl_double) function fgsl_fn_fdf_eval_f (
             type(fgsl_function_fdf), intent(inout) sfunc,
             real(fgsl_double), intent(in) x )
```

Evaluate a function value for a FGSL function with derivative object.

Parameters

sfunc	- function with derivative object.
x	- argument value

Returns

Function value

49.18.1.10 fgsl_fn_fdf_eval_f_df()

```
subroutine fgsl_fn_fdf_eval_f_df (
             type(fgsl_function_fdf), intent(inout) sfunc,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(out) y,
             real(fgsl_double), intent(out) dy )
```

Evaluate function as well as derivative value for a FGSL function with derivative object.

Parameters

sfunc	- function with derivative object.
x	- argument value
y	- function value
dy	- derivative value

49.18.1.11 fgsl_frexp()

```
real(fgsl_double) function fgsl_frexp (
             real(fgsl_double), intent(in) x,
             integer(fgsl_int), intent(out) e )
```

49.18.1.12 fgsl_function_fdf_free()

```
subroutine fgsl_function_fdf_free (
             type(fgsl_function_fdf), intent(inout) sfunc )
```

Free resources associated with a FGSL function with derivative object.

49.18.1.13 fgsl_function_fdf_init()

```
type(fgsl_function_fdf) function fgsl_function_fdf_init (
              f,
              df,
              fdf,
             type(c_ptr), intent(in) params )
```

Constructor for an FGSL function type including a derivative.

Parameters

f	- interface for a double precision valued function with a parameter of arbitrary type
df	- interface for a function evaluating the derivative of f
fdf	- interface for a subroutine evaluating f as well as its derivative given an argument and a parameter.
params	- parameter of arbitrary type

Returns

FGSL function with derivative object.

49.18.1.14 fgsl_function_free()

```
subroutine fgsl_function_free (
             type(fgsl_function), intent(inout) sfunc )
```

Free resources associated with a FGSL function object.

49.18.1.15 fgsl_function_init()

```
type(fgsl_function) function fgsl_function_init (
              func,
             type(c_ptr), intent(in) params )
```

Constructor for an FGSL function type.

Parameters

func	- interface for a double precision valued function with a parameter of arbitrary type
params	- parameter of arbitrary type

Returns

FGSL function object.

49.18.1.16 fgsl_isinf()

```
integer(fgsl_int) function fgsl_isinf (
             real(fgsl_double), intent(in) x )
```

49.18.1.17 fgsl_isnan()

```
integer(fgsl_int) function fgsl_isnan (
             real(fgsl_double), intent(in) x )
```

49.18.1.18 fgsl_ldexp()

```
real(fgsl_double) function fgsl_ldexp (
             real(fgsl_double), intent(in) x,
             integer(fgsl_int), intent(in) e )
```

49.18.1.19 fgsl_log1p()

```
real(fgsl_double) function fgsl_log1p (
             real(fgsl_double), intent(in) x )
```

49.19 api/min.finc File Reference

Functions/Subroutines

- type(fgsl_min_fminimizer) function fgsl_min_fminimizer_alloc (t)
- subroutine fgsl_min_fminimizer_free (s)
- integer(fgsl_int) function fgsl_min_fminimizer_set (s, f, x_minimum, x_lower, x_upper)
- integer(fgsl_int) function fgsl_min_fminimizer_set_with_values (s, f, x_minimum, f_minimum, x_lower, f_↩ lower, x_upper, f_upper)
- integer(fgsl_int) function fgsl_min_fminimizer_iterate (s)
- character(kind=fgsl_char, len=fgsl_strmax) function fgsl_min_fminimizer_name (s)
- real(fgsl_double) function fgsl_min_fminimizer_x_minimum (s)
- real(fgsl_double) function fgsl_min_fminimizer_x_lower (s)
- real(fgsl_double) function fgsl_min_fminimizer_x_upper (s)
- real(fgsl_double) function fgsl_min_fminimizer_f_minimum (s)
- real(fgsl_double) function fgsl_min_fminimizer_f_lower (s)
- real(fgsl_double) function fgsl_min_fminimizer_f_upper (s)
- integer(fgsl_int) function fgsl_min_test_interval (x_lower, x_upper, epsabs, epsrel)
- logical function fgsl_min_fminimizer_status (s)

49.19.1 Function/Subroutine Documentation

49.19.1.1 fgsl_min_fminimizer_alloc()

```
type(fgsl_min_fminimizer) function fgsl_min_fminimizer_alloc (
             type(fgsl_min_fminimizer_type), intent(in) t )
```

49.19.1.2 fgsl_min_fminimizer_f_lower()

```
real(fgsl_double) function fgsl_min_fminimizer_f_lower (
             type(fgsl_min_fminimizer), intent(in) s )
```

49.19.1.3 fgsl_min_fminimizer_f_minimum()

```
real(fgsl_double) function fgsl_min_fminimizer_f_minimum (
             type(fgsl_min_fminimizer), intent(in) s )
```

49.19.1.4 fgsl_min_fminimizer_f_upper()

```
real(fgsl_double) function fgsl_min_fminimizer_f_upper (
             type(fgsl_min_fminimizer), intent(in) s )
```

49.19.1.5 fgsl_min_fminimizer_free()

```
subroutine fgsl_min_fminimizer_free (
             type(fgsl_min_fminimizer), intent(inout) s )
```

49.19.1.6 fgsl_min_fminimizer_iterate()

```
integer(fgsl_int) function fgsl_min_fminimizer_iterate (
             type(fgsl_min_fminimizer), intent(in) s )
```

49.19.1.7 fgsl_min_fminimizer_name()

```
character(kind=fgsl_char,len=fgsl_strmax) function fgsl_min_fminimizer_name (
             type(fgsl_min_fminimizer), intent(in) s )
```

49.19.1.8 fgsl_min_fminimizer_set()

```
integer(fgsl_int) function fgsl_min_fminimizer_set (
             type(fgsl_min_fminimizer), intent(inout) s,
             type(fgsl_function), intent(in) f,
             real(fgsl_double), intent(in) x_minimum,
             real(fgsl_double), intent(in) x_lower,
             real(fgsl_double), intent(in) x_upper )
```

49.19.1.9 fgsl_min_fminimizer_set_with_values()

```
integer(fgsl_int) function fgsl_min_fminimizer_set_with_values (
             type(fgsl_min_fminimizer), intent(inout) s,
             type(fgsl_function), intent(in) f,
             real(fgsl_double), intent(in) x_minimum,
             real(fgsl_double), intent(in) f_minimum,
             real(fgsl_double), intent(in) x_lower,
             real(fgsl_double), intent(in) f_lower,
             real(fgsl_double), intent(in) x_upper,
             real(fgsl_double), intent(in) f_upper )
```

49.19.1.10 fgsl_min_fminimizer_status()

```
logical function fgsl_min_fminimizer_status (
             type(fgsl_min_fminimizer), intent(in) s )
```

49.19.1.11 fgsl_min_fminimizer_x_lower()

```
real(fgsl_double) function fgsl_min_fminimizer_x_lower (
             type(fgsl_min_fminimizer), intent(in) s )
```

49.19.1.12 fgsl_min_fminimizer_x_minimum()

```
real(fgsl_double) function fgsl_min_fminimizer_x_minimum (
             type(fgsl_min_fminimizer), intent(in) s )
```

49.19.1.13 fgsl_min_fminimizer_x_upper()

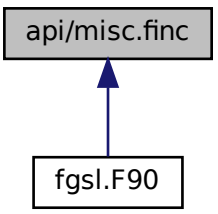
```
real(fgsl_double) function fgsl_min_fminimizer_x_upper (
             type(fgsl_min_fminimizer), intent(in) s )
```

49.19.1.14 fgsl_min_test_interval()

```
integer(fgsl_int) function fgsl_min_test_interval (
             real(fgsl_double), intent(in) x_lower,
             real(fgsl_double), intent(in) x_upper,
             real(fgsl_double), intent(in) epsabs,
             real(fgsl_double), intent(in) epsrel )
```

49.20 api/misc.finc File Reference

This graph shows which files directly or indirectly include this file:



Functions/Subroutines

- character(kind=fgsl_char, len=fgsl_strmax) function fgsl_name (c_name)

  C string to Fortran string conversion.
- integer(fgsl_size_t) function fgsl_sizeof_double (x)

  size of intrinsic double precision type
- integer(fgsl_size_t) function fgsl_sizeof_float (x)

  size of intrinsic single precision type
- integer(fgsl_size_t) function fgsl_sizeof_int (x)

  size of intrinsic integer type
- integer(fgsl_size_t) function fgsl_sizeof_long (x)

  size of intrinsic long integer type
- integer(fgsl_size_t) function fgsl_sizeof_size_t (x)

  size of intrinsic size_t integer type
- integer(fgsl_size_t) function fgsl_sizeof_char (x)

  size of intrinsic character type

49.20.1 Function/Subroutine Documentation

49.20.1.1 fgsl_name()

```
character(kind=fgsl_char, len=fgsl_strmax) function fgsl_name (
             type(c_ptr), intent(in) c_name )
```

C string to Fortran string conversion.

49.20.1.2 fgsl_sizeof_char()

```
integer(fgsl_size_t) function fgsl_sizeof_char (
             character(fgsl_char), intent(in) x )
```

size of intrinsic character type

49.20.1.3 fgsl_sizeof_double()

```
integer(fgsl_size_t) function fgsl_sizeof_double (
             real(fgsl_double), intent(in) x )
```

size of intrinsic double precision type

49.20.1.4 fgsl_sizeof_float()

```
integer(fgsl_size_t) function fgsl_sizeof_float (
             real(fgsl_float), intent(in) x )
```

size of intrinsic single precision type

49.20.1.5 fgsl_sizeof_int()

```
integer(fgsl_size_t) function fgsl_sizeof_int (
             integer(fgsl_int), intent(in) x )
```

size of intrinsic integer type

49.20.1.6 fgsl_sizeof_long()

```
integer(fgsl_size_t) function fgsl_sizeof_long (
             integer(fgsl_long), intent(in) x )
```

size of intrinsic long integer type

49.20.1.7 fgsl_sizeof_size_t()

```
integer(fgsl_size_t) function fgsl_sizeof_size_t (
             integer(fgsl_size_t), intent(in) x )
```

size of intrinsic size_t integer type

49.21 api/montecarlo.finc File Reference

Functions/Subroutines

- type(fgsl_monte_function) function fgsl_monte_function_init (func, dim, params)
- subroutine fgsl_monte_function_free (func)
- type(fgsl_monte_plain_state) function fgsl_monte_plain_alloc (dim)
- integer(fgsl_int) function fgsl_monte_plain_init (s)
- integer(fgsl_int) function fgsl_monte_plain_integrate (f, xl, xu, dim, calls, r, s, result, abserr)
- subroutine fgsl_monte_plain_free (s)
- type(fgsl_monte_miser_state) function fgsl_monte_miser_alloc (dim)
- integer(fgsl_int) function fgsl_monte_miser_init (s)
- integer(fgsl_int) function fgsl_monte_miser_integrate (f, xl, xu, dim, calls, r, s, result, abserr)
- subroutine fgsl_monte_miser_free (s)
- type(fgsl_monte_vegas_state) function fgsl_monte_vegas_alloc (dim)

- integer(fgsl_int) function fgsl_monte_vegas_init (s)
- integer(fgsl_int) function fgsl_monte_vegas_integrate (f, xl, xu, dim, calls, r, s, result, abserr)
- subroutine fgsl_monte_vegas_free (s)
- real(fgsl_double) function fgsl_monte_vegas_chisq (s)
- subroutine fgsl_monte_vegas_runval (s, result, sigma)
- logical function fgsl_monte_function_status (monte_function)
- logical function fgsl_monte_plain_status (monte_plain)
- logical function fgsl_monte_miser_status (monte_miser)
- logical function fgsl_monte_vegas_status (monte_vegas)
- subroutine fgsl_monte_miser_setparams (s, estimate_frac, min_calls, min_calls_per_bisection, alpha, dither)

  Accessor routine for setting the parameters for the MISER algorithm.
- subroutine fgsl_monte_miser_getparams (s, estimate_frac, min_calls, min_calls_per_bisection, alpha, dither)

  Accessor routine for reading out the parameters for the MISER algorithm.
- subroutine fgsl_monte_vegas_setparams (s, result, sigma, chisq, alpha, iterations, stage, mode, verbose, ostream)

  Accessor routine for setting the parameters for the VEGAS algorithm.
- subroutine fgsl_monte_vegas_getparams (s, result, sigma, chisq, alpha, iterations, stage, mode, verbose, ostream)

  Accessor routine for reading out the parameters for the VEGAS algorithm.

49.21.1 Function/Subroutine Documentation

49.21.1.1 fgsl_monte_function_free()

```
subroutine fgsl_monte_function_free (
             type(fgsl_monte_function), intent(inout) func )
```

49.21.1.2 fgsl_monte_function_init()

```
type(fgsl_monte_function) function fgsl_monte_function_init (
              func,
             integer(fgsl_size_t), intent(in) dim,
             type(c_ptr), intent(in) params )
```

49.21.1.3 fgsl_monte_function_status()

```
logical function fgsl_monte_function_status (
             type(fgsl_monte_function), intent(in) monte_function )
```

49.21.1.4 fgsl_monte_miser_alloc()

```
type(fgsl_monte_miser_state) function fgsl_monte_miser_alloc (
             integer(fgsl_size_t), value dim )
```

49.21.1.5 fgsl_monte_miser_free()

```
subroutine fgsl_monte_miser_free (
             type(fgsl_monte_miser_state), intent(inout) s )
```

49.21.1.6 fgsl_monte_miser_getparams()

```
subroutine fgsl_monte_miser_getparams (
             type(fgsl_monte_miser_state), intent(in) s,
             real(fgsl_double), intent(out) estimate_frac,
             integer(fgsl_size_t), intent(out) min_calls,
             integer(fgsl_size_t), intent(out) min_calls_per_bisection,
             real(fgsl_double), intent(out) alpha,
             real(fgsl_double), intent(out) dither )
```

Accessor routine for reading out the parameters for the MISER algorithm.

49.21.1.7 fgsl_monte_miser_init()

```
integer(fgsl_int) function fgsl_monte_miser_init (
             type(fgsl_monte_miser_state), intent(in) s )
```

49.21.1.8 fgsl_monte_miser_integrate()

```
integer(fgsl_int) function fgsl_monte_miser_integrate (
             type(fgsl_monte_function), intent(in) f,
             real(fgsl_double), dimension(dim), intent(in) xl,
             real(fgsl_double), dimension(dim), intent(in) xu,
             integer(fgsl_size_t), intent(in) dim,
             integer(fgsl_size_t), intent(in) calls,
             type(fgsl_rng), intent(in) r,
             type(fgsl_monte_miser_state), intent(in) s,
             real(fgsl_double), intent(out) result,
             real(fgsl_double), intent(out) abserr )
```

49.21.1.9 fgsl_monte_miser_setparams()

```
subroutine fgsl_monte_miser_setparams (
             type(fgsl_monte_miser_state), intent(inout) s,
             real(fgsl_double), intent(in) estimate_frac,
             integer(fgsl_size_t), intent(in) min_calls,
             integer(fgsl_size_t), intent(in) min_calls_per_bisection,
             real(fgsl_double), intent(in) alpha,
             real(fgsl_double), intent(in) dither )
```

Accessor routine for setting the parameters for the MISER algorithm.

49.21.1.10 fgsl_monte_miser_status()

```
logical function fgsl_monte_miser_status (
             type(fgsl_monte_miser_state), intent(in) monte_miser )
```

49.21.1.11 fgsl_monte_plain_alloc()

```
type(fgsl_monte_plain_state) function fgsl_monte_plain_alloc (
             integer(fgsl_size_t), intent(in) dim )
```

49.21.1.12 fgsl_monte_plain_free()

```
subroutine fgsl_monte_plain_free (
             type(fgsl_monte_plain_state), intent(inout) s )
```

49.21.1.13 fgsl_monte_plain_init()

```
integer(fgsl_int) function fgsl_monte_plain_init (
             type(fgsl_monte_plain_state), intent(in) s )
```

49.21.1.14 fgsl_monte_plain_integrate()

```
integer(fgsl_int) function fgsl_monte_plain_integrate (
             type(fgsl_monte_function), intent(in) f,
             real(fgsl_double), dimension(dim), intent(in) xl,
             real(fgsl_double), dimension(dim), intent(in) xu,
             integer(fgsl_size_t), intent(in) dim,
             integer(fgsl_size_t), intent(in) calls,
             type(fgsl_rng), intent(in) r,
             type(fgsl_monte_plain_state), intent(in) s,
             real(fgsl_double), intent(out) result,
             real(fgsl_double), intent(out) abserr )
```

49.21.1.15 fgsl_monte_plain_status()

```
logical function fgsl_monte_plain_status (
            type(fgsl_monte_plain_state), intent(in) monte_plain )
```

49.21.1.16 fgsl_monte_vegas_alloc()

```
type(fgsl_monte_vegas_state) function fgsl_monte_vegas_alloc (
            integer(fgsl_size_t), value dim )
```

49.21.1.17 fgsl_monte_vegas_chisq()

```
real(fgsl_double) function fgsl_monte_vegas_chisq (
            type(fgsl_monte_vegas_state), intent(in) s )
```

49.21.1.18 fgsl_monte_vegas_free()

```
subroutine fgsl_monte_vegas_free (
            type(fgsl_monte_vegas_state), intent(inout) s )
```

49.21.1.19 fgsl_monte_vegas_getparams()

```
subroutine fgsl_monte_vegas_getparams (
            type(fgsl_monte_vegas_state), intent(in) s,
            real(fgsl_double), intent(out) result,
            real(fgsl_double), intent(out) sigma,
            real(fgsl_double), intent(out) chisq,
            real(fgsl_double), intent(out) alpha,
            integer(fgsl_size_t), intent(out) iterations,
            integer(fgsl_int), intent(out) stage,
            integer(fgsl_int), intent(out) mode,
            integer(fgsl_int), intent(out) verbose,
            type(fgsl_file), intent(out) ostream )
```

Accessor routine for reading out the parameters for the VEGAS algorithm.

49.21.1.20 fgsl_monte_vegas_init()

```
integer(fgsl_int) function fgsl_monte_vegas_init (
            type(fgsl_monte_vegas_state), intent(in) s )
```

49.21.1.21 fgsl_monte_vegas_integrate()

```
integer(fgsl_int) function fgsl_monte_vegas_integrate (
             type(fgsl_monte_function), intent(in) f,
             real(fgsl_double), dimension(dim), intent(in) xl,
             real(fgsl_double), dimension(dim), intent(in) xu,
             integer(fgsl_size_t), intent(in) dim,
             integer(fgsl_size_t), intent(in) calls,
             type(fgsl_rng), intent(in) r,
             type(fgsl_monte_vegas_state), intent(in) s,
             real(fgsl_double), intent(out) result,
             real(fgsl_double), intent(out) abserr )
```

49.21.1.22 fgsl_monte_vegas_runval()

```
subroutine fgsl_monte_vegas_runval (
             type(fgsl_monte_vegas_state), intent(in) s,
             real(fgsl_double), intent(out) result,
             real(fgsl_double), intent(out) sigma )
```

49.21.1.23 fgsl_monte_vegas_setparams()

```
subroutine fgsl_monte_vegas_setparams (
             type(fgsl_monte_vegas_state), intent(inout) s,
             real(fgsl_double), intent(in) result,
             real(fgsl_double), intent(in) sigma,
             real(fgsl_double), intent(in) chisq,
             real(fgsl_double), intent(in) alpha,
             integer(fgsl_size_t), intent(in) iterations,
             integer(fgsl_int), intent(in) stage,
             integer(fgsl_int), intent(in) mode,
             integer(fgsl_int), intent(in) verbose,
             type(fgsl_file), intent(in) ostream )
```

Accessor routine for setting the parameters for the VEGAS algorithm.

49.21.1.24 fgsl_monte_vegas_status()

```
logical function fgsl_monte_vegas_status (
             type(fgsl_monte_vegas_state), intent(in) monte_vegas )
```

49.22 api/movstat.finc File Reference

Functions/Subroutines

- type(fgsl_movstat_workspace) function fgsl_movstat_alloc (k)
- type(fgsl_movstat_workspace) function fgsl_movstat_alloc2 (k, j)
- subroutine fgsl_movstat_free (w)
- integer(fgsl_int) function fgsl_movstat_mean (endtype, x, y, w)
- integer(fgsl_int) function fgsl_movstat_variance (endtype, x, y, w)
- integer(fgsl_int) function fgsl_movstat_sd (endtype, x, y, w)
- integer(fgsl_int) function fgsl_movstat_min (endtype, x, y, w)
- integer(fgsl_int) function fgsl_movstat_max (endtype, x, y, w)
- integer(fgsl_int) function fgsl_movstat_minmax (endtype, x, y_min, y_max, w)
- integer(fgsl_int) function fgsl_movstat_sum (endtype, x, y, w)
- integer(fgsl_int) function fgsl_movstat_median (endtype, x, y, w)
- integer(fgsl_int) function fgsl_movstat_mad0 (endtype, x, xmedian, xmad, w)
- integer(fgsl_int) function fgsl_movstat_mad (endtype, x, xmedian, xmad, w)
- integer(fgsl_int) function fgsl_movstat_qqr (endtype, x, q, xqqr, w)
- integer(fgsl_int) function fgsl_movstat_sn (endtype, x, xscale, w)
- integer(fgsl_int) function fgsl_movstat_qn (endtype, x, xscale, w)
- integer(fgsl_int) function fgsl_movstat_apply (endtype, f, x, y, w)
- integer(fgsl_int) function fgsl_movstat_fill (endtype, x, idx, h, j, window)

49.22.1 Function/Subroutine Documentation

49.22.1.1 fgsl_movstat_alloc()

```
type(fgsl_movstat_workspace) function fgsl_movstat_alloc (
             integer(fgsl_size_t), intent(in) k )
```

49.22.1.2 fgsl_movstat_alloc2()

```
type(fgsl_movstat_workspace) function fgsl_movstat_alloc2 (
             integer(fgsl_size_t), intent(in) k,
             integer(fgsl_size_t), intent(in) j )
```

49.22.1.3 fgsl_movstat_apply()

```
integer(fgsl_int) function fgsl_movstat_apply (
             integer(fgsl_int), intent(in) endtype,
             type(fgsl_movstat_function), intent(in) f,
             type(fgsl_vector), intent(in) x,
             type(fgsl_vector), intent(inout) y,
             type(fgsl_movstat_workspace), intent(inout) w )
```

49.22.1.4 fgsl_movstat_fill()

```
integer(fgsl_int) function fgsl_movstat_fill (
             integer(fgsl_int), intent(in) endtype,
             type(fgsl_vector), intent(in) x,
             integer(fgsl_size_t), intent(in) idx,
             integer(fgsl_size_t), intent(in) h,
             integer(fgsl_size_t), intent(in) j,
             real(fgsl_double), intent(inout) window )
```

49.22.1.5 fgsl_movstat_free()

```
subroutine fgsl_movstat_free (
             type(fgsl_movstat_workspace), intent(inout) w )
```

49.22.1.6 fgsl_movstat_mad()

```
integer(fgsl_int) function fgsl_movstat_mad (
             integer(fgsl_int), intent(in) endtype,
             type(fgsl_vector), intent(in) x,
             type(fgsl_vector), intent(inout) xmedian,
             type(fgsl_vector), intent(inout) xmad,
             type(fgsl_movstat_workspace), intent(inout) w )
```

49.22.1.7 fgsl_movstat_mad0()

```
integer(fgsl_int) function fgsl_movstat_mad0 (
             integer(fgsl_int), intent(in) endtype,
             type(fgsl_vector), intent(in) x,
             type(fgsl_vector), intent(inout) xmedian,
             type(fgsl_vector), intent(inout) xmad,
             type(fgsl_movstat_workspace), intent(inout) w )
```

49.22.1.8 fgsl_movstat_max()

```
integer(fgsl_int) function fgsl_movstat_max (
             integer(fgsl_int), intent(in) endtype,
             type(fgsl_vector), intent(in) x,
             type(fgsl_vector), intent(inout) y,
             type(fgsl_movstat_workspace), intent(inout) w )
```

49.22.1.9 fgsl_movstat_mean()

```
integer(fgsl_int) function fgsl_movstat_mean (
             integer(fgsl_int), intent(in) endtype,
             type(fgsl_vector), intent(in) x,
             type(fgsl_vector), intent(inout) y,
             type(fgsl_movstat_workspace), intent(inout) w )
```

49.22.1.10 fgsl_movstat_median()

```
integer(fgsl_int) function fgsl_movstat_median (
             integer(fgsl_int), intent(in) endtype,
             type(fgsl_vector), intent(in) x,
             type(fgsl_vector), intent(inout) y,
             type(fgsl_movstat_workspace), intent(inout) w )
```

49.22.1.11 fgsl_movstat_min()

```
integer(fgsl_int) function fgsl_movstat_min (
             integer(fgsl_int), intent(in) endtype,
             type(fgsl_vector), intent(in) x,
             type(fgsl_vector), intent(inout) y,
             type(fgsl_movstat_workspace), intent(inout) w )
```

49.22.1.12 fgsl_movstat_minmax()

```
integer(fgsl_int) function fgsl_movstat_minmax (
             integer(fgsl_int), intent(in) endtype,
             type(fgsl_vector), intent(in) x,
             type(fgsl_vector), intent(inout) y_min,
             type(fgsl_vector), intent(inout) y_max,
             type(fgsl_movstat_workspace), intent(inout) w )
```

49.22.1.13 fgsl_movstat_qn()

```
integer(fgsl_int) function fgsl_movstat_qn (
             integer(fgsl_int), intent(in) endtype,
             type(fgsl_vector), intent(in) x,
             type(fgsl_vector), intent(inout) xscale,
             type(fgsl_movstat_workspace), intent(inout) w )
```

49.22.1.14 fgsl_movstat_qqr()

```
integer(fgsl_int) function fgsl_movstat_qqr (
             integer(fgsl_int), intent(in) endtype,
             type(fgsl_vector), intent(in) x,
             real(fgsl_double), intent(in) q,
             type(fgsl_vector), intent(inout) xqqr,
             type(fgsl_movstat_workspace), intent(inout) w )
```

49.22.1.15 fgsl_movstat_sd()

```
integer(fgsl_int) function fgsl_movstat_sd (
             integer(fgsl_int), intent(in) endtype,
             type(fgsl_vector), intent(in) x,
             type(fgsl_vector), intent(inout) y,
             type(fgsl_movstat_workspace), intent(inout) w )
```

49.22.1.16 fgsl_movstat_sn()

```
integer(fgsl_int) function fgsl_movstat_sn (
             integer(fgsl_int), intent(in) endtype,
             type(fgsl_vector), intent(in) x,
             type(fgsl_vector), intent(inout) xscale,
             type(fgsl_movstat_workspace), intent(inout) w )
```

49.22.1.17 fgsl_movstat_sum()

```
integer(fgsl_int) function fgsl_movstat_sum (
             integer(fgsl_int), intent(in) endtype,
             type(fgsl_vector), intent(in) x,
             type(fgsl_vector), intent(inout) y,
             type(fgsl_movstat_workspace), intent(inout) w )
```

49.22.1.18 fgsl_movstat_variance()

```
integer(fgsl_int) function fgsl_movstat_variance (
             integer(fgsl_int), intent(in) endtype,
             type(fgsl_vector), intent(in) x,
             type(fgsl_vector), intent(inout) y,
             type(fgsl_movstat_workspace), intent(inout) w )
```

49.23 api/multifit.finc File Reference

Functions/Subroutines

- type(fgsl_multifit_function) function fgsl_multifit_function_init (func, ndim, p, params)
- type(fgsl_multifit_function_fdf) function fgsl_multifit_function_fdf_init (func, dfunc, fdfunc, ndim, p, params)
- subroutine fgsl_multifit_function_free (fun)
- subroutine fgsl_multifit_function_fdf_free (fun)
- type(fgsl_multifit_fsolver) function fgsl_multifit_fsolver_alloc (t, n, p)
- type(fgsl_multifit_fdfsolver) function fgsl_multifit_fdfsolver_alloc (t, n, p)
- subroutine fgsl_multifit_fsolver_free (s)
- subroutine fgsl_multifit_fdfsolver_free (s)
- integer(fgsl_int) function fgsl_multifit_fsolver_set (s, f, x)
- integer(fgsl_int) function fgsl_multifit_fdfsolver_set (s, fdf, x)
- integer(fgsl_int) function fgsl_multifit_fdfsolver_wset (s, fdf, x, wts)
- character(kind=fgsl_char, len=fgsl_strmax) function fgsl_multifit_fsolver_name (s)
- character(kind=fgsl_char, len=fgsl_strmax) function fgsl_multifit_fdfsolver_name (s)
- integer(fgsl_int) function fgsl_multifit_fsolver_iterate (s)
- integer(fgsl_int) function fgsl_multifit_fdfsolver_iterate (s)
- type(fgsl_vector) function fgsl_multifit_fsolver_position (s)
- type(fgsl_vector) function fgsl_multifit_fdfsolver_position (s)
- type(fgsl_vector) function fgsl_multifit_fdfsolver_dx (s)
- type(fgsl_vector) function fgsl_multifit_fdfsolver_f (s)
- integer(fgsl_int) function fgsl_multifit_fdfsolver_jac (s, J)
- integer(fgsl_int) function fgsl_multifit_test_delta (dx, x, epsabs, epsrel)
- integer(fgsl_int) function fgsl_multifit_test_gradient (g, epsabs)
- integer(fgsl_int) function fgsl_multifit_gradient (j, f, g)
- integer(fgsl_int) function fgsl_multifit_covar (j, epsrel, covar)
- integer(fgsl_int) function fgsl_multifit_covar_qrpt (r, perm, epsrel, covar)
- logical function fgsl_multifit_fsolver_status (s)
- logical function fgsl_multifit_fdfsolver_status (s)
- integer(fgsl_int) function fgsl_multifit_fsolver_driver (s, maxiter, epsabs, epsrel)
- integer(fgsl_int) function fgsl_multifit_fdfsolver_driver (s, maxiter, xtol, gtol, ftol, info)
- integer(fgsl_int) function fgsl_multifit_fdfsolver_dif_df_wts (x, wts, fdf, f, J)
- integer(fgsl_int) function fgsl_multifit_fdfsolver_dif_df_nowts (x, fdf, f, J)
- type(fgsl_multifit_robust_workspace) function fgsl_multifit_robust_alloc (t, n, p)
- subroutine fgsl_multifit_robust_free (w)
- integer(fgsl_int) function fgsl_multifit_robust_tune (tune, w)
- character(kind=fgsl_char, len=fgsl_strmax) function fgsl_multifit_robust_name (w)
- type(fgsl_multifit_robust_stats) function fgsl_multifit_robust_statistics (w)
- integer(c_int) function fgsl_multifit_robust (X, y, c, cov, w)
- integer(c_int) function fgsl_multifit_robust_est (x, c, cov, y, y_err)
- type(fgsl_vector) function fgsl_multifit_fdfsolver_residual (s)
- integer(fgsl_size_t) function fgsl_multifit_fdfsolver_niter (s)
- integer(fgsl_int) function fgsl_multifit_eval_wf_wts (fdf, x, wts, y)
- integer(fgsl_int) function fgsl_multifit_eval_wf_nowts (fdf, x, y)
- integer(fgsl_int) function fgsl_multifit_eval_wdf_wts (fdf, x, wts, dy)
- integer(fgsl_int) function fgsl_multifit_eval_wdf_nowts (fdf, x, dy)
- integer(fgsl_int) function fgsl_multifit_fdfsolver_test (s, xtol, gtol, ftol, info)
- type(fgsl_multifit_linear_workspace) function fgsl_multifit_linear_alloc (n, p)
- subroutine fgsl_multifit_linear_free (w)
- integer(fgsl_int) function fgsl_multifit_linear (x, y, c, cov, chisq, work)
- integer(fgsl_int) function fgsl_multifit_linear_tsvd (x, y, tol, c, cov, chisq, rank, work)
- integer(fgsl_int) function fgsl_multifit_linear_svd (x, work)

- integer(fgsl_int) function fgsl_multifit_linear_bsvd (X, work)
- integer(fgsl_int) function fgsl_multifit_linear_solve (lambda, X, y, c, rnorm, snorm, work)
- integer(fgsl_int) function fgsl_multifit_linear_applyw (X, w, y, WX, Wy)
- integer(fgsl_int) function fgsl_multifit_linear_stdform1 (L, X, y, Xs, ys, work)
- integer(fgsl_int) function fgsl_multifit_linear_wstdform1 (L, X, w, y, Xs, ys, work)
- integer(fgsl_int) function fgsl_multifit_linear_l_decomp (L, tau)
- integer(fgsl_int) function fgsl_multifit_linear_stdform2 (LQR, Ltau, X, y, Xs, ys, M, work)
- integer(fgsl_int) function fgsl_multifit_linear_wstdform2 (LQR, Ltau, X, w, y, Xs, ys, M, work)
- integer(fgsl_int) function fgsl_multifit_linear_genform1 (L, cs, c, work)
- integer(fgsl_int) function fgsl_multifit_linear_genform2 (LQR, Ltau, X, y, cs, M, c, work)
- integer(fgsl_int) function fgsl_multifit_linear_wgenform2 (LQR, Ltau, X, w, y, cs, M, c, work)
- integer(fgsl_int) function fgsl_multifit_linear_lreg (smin, smax, reg_param)
- integer(fgsl_int) function fgsl_multifit_linear_lcurve (y, reg_param, rho, eta, work)
- integer(fgsl_int) function fgsl_multifit_linear_lcorner (rho, eta, idx)
- integer(fgsl_int) function fgsl_multifit_linear_lcorner2 (reg_param, eta, idx)
- integer(fgsl_int) function fgsl_multifit_linear_gcv_init (y, reg_param, uty, delta0, work)
- integer(fgsl_int) function fgsl_multifit_linear_gcv_curve (reg_param, uty, delta0, g, work)
- integer(fgsl_int) function fgsl_multifit_linear_gcv_min (reg_param, uty, delta0, g, lambda, work)
- real(fgsl_double) function fgsl_multifit_linear_gcv_calc (lambda, uty, delta0, work)
- integer(fgsl_int) function fgsl_multifit_linear_gcv (y, reg_param, g, lambda, g_lambda, work)
- integer(fgsl_int) function fgsl_multifit_linear_lk (p, k, l)
- integer(fgsl_int) function fgsl_multifit_linear_lsobolev (p, kmax, alpha, l, work)
- real(fgsl_double) function fgsl_multifit_linear_rcond (w)
- integer(fgsl_int) function fgsl_multifit_robust_maxiter (maxiter, w)
- integer(fgsl_int) function fgsl_multifit_robust_residuals (X, y, c, r, w)
- integer(fgsl_int) function fgsl_multifit_robust_weights (r, wts, w)
- integer(fgsl_int) function fgsl_multifit_wlinear (x, w, y, c, cov, chisq, work)
- integer(fgsl_int) function fgsl_multifit_wlinear_tsvd (x, w, y, tol, c, cov, chisq, rank, work)
- integer(fgsl_int) function fgsl_multifit_wlinear_svd (x, w, y, tol, rank, c, cov, chisq, work)
- integer(fgsl_int) function fgsl_multifit_wlinear_usvd (x, w, y, tol, rank, c, cov, chisq, work)
- integer(fgsl_int) function fgsl_multifit_linear_est (x, c, cov, y, y_err)
- integer(fgsl_int) function fgsl_multifit_linear_residuals (x, y, c, r)
- integer(fgsl_size_t) function fgsl_multifit_linear_rank (tol, work)
- logical function fgsl_multifit_status (multifit)
- type(fgsl_multifit_fdfridge) function fgsl_multifit_fdfridge_alloc (T, n, p)
- subroutine fgsl_multifit_fdfridge_free (work)
- character(kind=fgsl_char, len=fgsl_strmax) function fgsl_multifit_fdfridge_name (w)
- type(fgsl_vector) function fgsl_multifit_fdfridge_position (w)
- type(fgsl_vector) function fgsl_multifit_fdfridge_residual (w)
- integer(fgsl_size_t) function fgsl_multifit_fdfridge_niter (w)
- integer(fgsl_int) function fgsl_multifit_fdfridge_set (w, f, x, lambda)
- integer(fgsl_int) function fgsl_multifit_fdfridge_wset (w, f, x, lambda, wts)
- integer(fgsl_int) function fgsl_multifit_fdfridge_set2 (w, f, x, lambda)
- integer(fgsl_int) function fgsl_multifit_fdfridge_wset2 (w, f, x, lambda, wts)
- integer(fgsl_int) function fgsl_multifit_fdfridge_set3 (w, f, x, L)
- integer(fgsl_int) function fgsl_multifit_fdfridge_wset3 (w, f, x, L, wts)
- integer(fgsl_int) function fgsl_multifit_fdfridge_iterate (w)
- integer(fgsl_int) function fgsl_multifit_fdfridge_driver (w, maxiter, xtol, gtol, ftol, info)

49.23.1 Function/Subroutine Documentation

49.23.1.1 fgsl_multifit_covar()

```
integer(fgsl_int) function fgsl_multifit_covar (
             type(fgsl_matrix), intent(in) j,
             real(fgsl_double), intent(in) epsrel,
             type(fgsl_matrix), intent(inout) covar )
```

49.23.1.2 fgsl_multifit_covar_qrpt()

```
integer(fgsl_int) function fgsl_multifit_covar_qrpt (
             type(fgsl_matrix), intent(inout) r,
             type(fgsl_permutation), intent(inout) perm,
             real(fgsl_double), intent(in) epsrel,
             type(fgsl_matrix), intent(inout) covar )
```

49.23.1.3 fgsl_multifit_eval_wdf_nowts()

```
integer(fgsl_int) function fgsl_multifit_eval_wdf_nowts (
             type(fgsl_multifit_function_fdf), intent(inout) fdf,
             type(fgsl_vector), intent(in) x,
             type(fgsl_matrix), intent(inout) dy )
```

49.23.1.4 fgsl_multifit_eval_wdf_wts()

```
integer(fgsl_int) function fgsl_multifit_eval_wdf_wts (
             type(fgsl_multifit_function_fdf), intent(inout) fdf,
             type(fgsl_vector), intent(in) x,
             type(fgsl_vector), intent(in) wts,
             type(fgsl_matrix), intent(inout) dy )
```

49.23.1.5 fgsl_multifit_eval_wf_nowts()

```
integer(fgsl_int) function fgsl_multifit_eval_wf_nowts (
             type(fgsl_multifit_function_fdf), intent(inout) fdf,
             type(fgsl_vector), intent(in) x,
             type(fgsl_vector), intent(inout) y )
```

49.23.1.6 fgsl_multifit_eval_wf_wts()

```
integer(fgsl_int) function fgsl_multifit_eval_wf_wts (
             type(fgsl_multifit_function_fdf), intent(inout) fdf,
             type(fgsl_vector), intent(in) x,
             type(fgsl_vector), intent(in) wts,
             type(fgsl_vector), intent(inout) y )
```

49.23.1.7 fgsl_multifit_fdfridge_alloc()

```
type(fgsl_multifit_fdfridge) function fgsl_multifit_fdfridge_alloc (
             type(fgsl_multifit_fdfsolver_type), intent(in) T,
             integer(fgsl_size_t), intent(in) n,
             integer(fgsl_size_t), intent(in) p )
```

49.23.1.8 fgsl_multifit_fdfridge_driver()

```
integer(fgsl_int) function fgsl_multifit_fdfridge_driver (
             type(fgsl_multifit_fdfridge), intent(inout) w,
             integer(fgsl_size_t), intent(in) maxiter,
             real(fgsl_double), intent(in) xtol,
             real(fgsl_double), intent(in) gtol,
             real(fgsl_double), intent(in) ftol,
             integer(fgsl_int), intent(out) info )
```

49.23.1.9 fgsl_multifit_fdfridge_free()

```
subroutine fgsl_multifit_fdfridge_free (
             type(fgsl_multifit_fdfridge), intent(inout) work )
```

49.23.1.10 fgsl_multifit_fdfridge_iterate()

```
integer(fgsl_int) function fgsl_multifit_fdfridge_iterate (
             type(fgsl_multifit_fdfridge), intent(inout) w )
```

49.23.1.11 fgsl_multifit_fdfridge_name()

```
character(kind=fgsl_char,len=fgsl_strmax) function fgsl_multifit_fdfridge_name (
             type(fgsl_multifit_fdfridge), intent(in) w )
```

49.23.1.12 fgsl_multifit_fdfridge_niter()

```
integer(fgsl_size_t) function fgsl_multifit_fdfridge_niter (
             type(fgsl_multifit_fdfridge), intent(in) w )
```

49.23.1.13 fgsl_multifit_fdfridge_position()

```
type(fgsl_vector) function fgsl_multifit_fdfridge_position (
             type(fgsl_multifit_fdfridge), intent(in) w )
```

49.23.1.14 fgsl_multifit_fdfridge_residual()

```
type(fgsl_vector) function fgsl_multifit_fdfridge_residual (
             type(fgsl_multifit_fdfridge), intent(in) w )
```

49.23.1.15 fgsl_multifit_fdfridge_set()

```
integer(fgsl_int) function fgsl_multifit_fdfridge_set (
             type(fgsl_multifit_fdfridge), intent(inout) w,
             type(fgsl_multifit_function_fdf), intent(inout) f,
             type(fgsl_vector), intent(in) x,
             real(fgsl_double), intent(in) lambda )
```

49.23.1.16 fgsl_multifit_fdfridge_set2()

```
integer(fgsl_int) function fgsl_multifit_fdfridge_set2 (
             type(fgsl_multifit_fdfridge), intent(inout) w,
             type(fgsl_multifit_function_fdf), intent(inout) f,
             type(fgsl_vector), intent(in) x,
             type(fgsl_vector), intent(in) lambda )
```

49.23.1.17 fgsl_multifit_fdfridge_set3()

```
integer(fgsl_int) function fgsl_multifit_fdfridge_set3 (
             type(fgsl_multifit_fdfridge), intent(inout) w,
             type(fgsl_multifit_function_fdf), intent(inout) f,
             type(fgsl_vector), intent(in) x,
             type(fgsl_matrix), intent(in) L )
```

49.23.1.18 fgsl_multifit_fdfridge_wset()

```
integer(fgsl_int) function fgsl_multifit_fdfridge_wset (
             type(fgsl_multifit_fdfridge), intent(inout) w,
             type(fgsl_multifit_function_fdf), intent(inout) f,
             type(fgsl_vector), intent(in) x,
             real(fgsl_double), intent(in) lambda,
             type(fgsl_vector), intent(in) wts )
```

49.23.1.19 fgsl_multifit_fdfridge_wset2()

```
integer(fgsl_int) function fgsl_multifit_fdfridge_wset2 (
             type(fgsl_multifit_fdfridge), intent(inout) w,
             type(fgsl_multifit_function_fdf), intent(inout) f,
             type(fgsl_vector), intent(in) x,
             type(fgsl_vector), intent(in) lambda,
             type(fgsl_vector), intent(in) wts )
```

49.23.1.20 fgsl_multifit_fdfridge_wset3()

```
integer(fgsl_int) function fgsl_multifit_fdfridge_wset3 (
             type(fgsl_multifit_fdfridge), intent(inout) w,
             type(fgsl_multifit_function_fdf), intent(inout) f,
             type(fgsl_vector), intent(in) x,
             type(fgsl_matrix), intent(in) L,
             type(fgsl_vector), intent(in) wts )
```

49.23.1.21 fgsl_multifit_fdfsolver_alloc()

```
type(fgsl_multifit_fdfsolver) function fgsl_multifit_fdfsolver_alloc (
             type(fgsl_multifit_fdfsolver_type), intent(in) t,
             integer(fgsl_size_t), intent(in) n,
             integer(fgsl_size_t), intent(in) p )
```

49.23.1.22 fgsl_multifit_fdfsolver_dif_df_nowts()

```
integer(fgsl_int) function fgsl_multifit_fdfsolver_dif_df_nowts (
             type(fgsl_vector), intent(in) x,
             type(fgsl_multifit_function_fdf), intent(inout) fdf,
             type(fgsl_vector), intent(in) f,
             type(fgsl_matrix), intent(inout) J )
```

49.23.1.23 fgsl_multifit_fdfsolver_dif_df_wts()

```
integer(fgsl_int) function fgsl_multifit_fdfsolver_dif_df_wts (
             type(fgsl_vector), intent(in) x,
             type(fgsl_vector), intent(in) wts,
             type(fgsl_multifit_function_fdf), intent(inout) fdf,
             type(fgsl_vector), intent(in) f,
             type(fgsl_matrix), intent(inout) J )
```

49.23.1.24 fgsl_multifit_fdfsolver_driver()

```
integer(fgsl_int) function fgsl_multifit_fdfsolver_driver (
             type(fgsl_multifit_fdfsolver), intent(inout) s,
             integer(fgsl_size_t), intent(in) maxiter,
             real(fgsl_double), intent(in) xtol,
             real(fgsl_double), intent(in) gtol,
             real(fgsl_double), intent(in) ftol,
             integer(fgsl_int), intent(out) info )
```

49.23.1.25 fgsl_multifit_fdfsolver_dx()

```
type(fgsl_vector) function fgsl_multifit_fdfsolver_dx (
             type(fgsl_multifit_fdfsolver), intent(in) s )
```

49.23.1.26 fgsl_multifit_fdfsolver_f()

```
type(fgsl_vector) function fgsl_multifit_fdfsolver_f (
             type(fgsl_multifit_fdfsolver), intent(in) s )
```

49.23.1.27 fgsl_multifit_fdfsolver_free()

```
subroutine fgsl_multifit_fdfsolver_free (
             type(fgsl_multifit_fdfsolver), intent(inout) s )
```

49.23.1.28 fgsl_multifit_fdfsolver_iterate()

```
integer(fgsl_int) function fgsl_multifit_fdfsolver_iterate (
             type(fgsl_multifit_fdfsolver), intent(in) s )
```

49.23.1.29 fgsl_multifit_fdfsolver_jac()

```
integer(fgsl_int) function fgsl_multifit_fdfsolver_jac (
             type(fgsl_multifit_fdfsolver), intent(in) s,
             type(fgsl_matrix), intent(inout) J )
```

49.23.1.30 fgsl_multifit_fdfsolver_name()

```
character(kind=fgsl_char,len=fgsl_strmax) function fgsl_multifit_fdfsolver_name (
             type(fgsl_multifit_fdfsolver), intent(in) s )
```

49.23.1.31 fgsl_multifit_fdfsolver_niter()

```
integer(fgsl_size_t) function fgsl_multifit_fdfsolver_niter (
             type(fgsl_multifit_fdfsolver), intent(in) s )
```

49.23.1.32 fgsl_multifit_fdfsolver_position()

```
type(fgsl_vector) function fgsl_multifit_fdfsolver_position (
             type(fgsl_multifit_fdfsolver), intent(in) s )
```

49.23.1.33 fgsl_multifit_fdfsolver_residual()

```
type(fgsl_vector) function fgsl_multifit_fdfsolver_residual (
             type(fgsl_multifit_fdfsolver), intent(in) s )
```

49.23.1.34 fgsl_multifit_fdfsolver_set()

```
integer(fgsl_int) function fgsl_multifit_fdfsolver_set (
             type(fgsl_multifit_fdfsolver), intent(inout) s,
             type(fgsl_multifit_function_fdf), intent(in) fdf,
             type(fgsl_vector), intent(in) x )
```

49.23.1.35 fgsl_multifit_fdfsolver_status()

```
logical function fgsl_multifit_fdfsolver_status (
            type(fgsl_multifit_fdfsolver), intent(in) s )
```

49.23.1.36 fgsl_multifit_fdfsolver_test()

```
integer(fgsl_int) function fgsl_multifit_fdfsolver_test (
            type(fgsl_multifit_fdfsolver), intent(in) s,
            real(fgsl_double), intent(in) xtol,
            real(fgsl_double), intent(in) gtol,
            real(fgsl_double), intent(in) ftol,
            integer(fgsl_int), intent(out) info )
```

49.23.1.37 fgsl_multifit_fdfsolver_wset()

```
integer(fgsl_int) function fgsl_multifit_fdfsolver_wset (
            type(fgsl_multifit_fdfsolver), intent(inout) s,
            type(fgsl_multifit_function_fdf), intent(in) fdf,
            type(fgsl_vector), intent(in) x,
            type(fgsl_vector), intent(in) wts )
```

49.23.1.38 fgsl_multifit_fsolver_alloc()

```
type(fgsl_multifit_fsolver) function fgsl_multifit_fsolver_alloc (
            type(fgsl_multifit_fsolver_type), intent(in) t,
            integer(fgsl_size_t), intent(in) n,
            integer(fgsl_size_t), intent(in) p )
```

49.23.1.39 fgsl_multifit_fsolver_driver()

```
integer(fgsl_int) function fgsl_multifit_fsolver_driver (
            type(fgsl_multifit_fsolver), intent(inout) s,
            integer(fgsl_size_t), intent(in) maxiter,
            real(fgsl_double), intent(in) epsabs,
            real(fgsl_double), intent(in) epsrel )
```

49.23.1.40 fgsl_multifit_fsolver_free()

```
subroutine fgsl_multifit_fsolver_free (
             type(fgsl_multifit_fsolver), intent(inout) s )
```

49.23.1.41 fgsl_multifit_fsolver_iterate()

```
integer(fgsl_int) function fgsl_multifit_fsolver_iterate (
             type(fgsl_multifit_fsolver), intent(in) s )
```

49.23.1.42 fgsl_multifit_fsolver_name()

```
character(kind=fgsl_char,len=fgsl_strmax) function fgsl_multifit_fsolver_name (
             type(fgsl_multifit_fsolver), intent(in) s )
```

49.23.1.43 fgsl_multifit_fsolver_position()

```
type(fgsl_vector) function fgsl_multifit_fsolver_position (
             type(fgsl_multifit_fsolver), intent(in) s )
```

49.23.1.44 fgsl_multifit_fsolver_set()

```
integer(fgsl_int) function fgsl_multifit_fsolver_set (
             type(fgsl_multifit_fsolver), intent(inout) s,
             type(fgsl_multifit_function), intent(in) f,
             type(fgsl_vector), intent(in) x )
```

49.23.1.45 fgsl_multifit_fsolver_status()

```
logical function fgsl_multifit_fsolver_status (
             type(fgsl_multifit_fsolver), intent(in) s )
```

49.23.1.46 fgsl_multifit_function_fdf_free()

```
subroutine fgsl_multifit_function_fdf_free (
             type(fgsl_multifit_function_fdf), intent(inout) fun )
```

49.23.1.47 fgsl_multifit_function_fdf_init()

```
type(fgsl_multifit_function_fdf) function fgsl_multifit_function_fdf_init (
              func,
              dfunc,
              fdfunc,
             integer(fgsl_size_t), intent(in) ndim,
             integer(fgsl_size_t), intent(in) p,
             type(c_ptr), intent(in) params )
```

49.23.1.48 fgsl_multifit_function_free()

```
subroutine fgsl_multifit_function_free (
             type(fgsl_multifit_function), intent(inout) fun )
```

49.23.1.49 fgsl_multifit_function_init()

```
type(fgsl_multifit_function) function fgsl_multifit_function_init (
              func,
             integer(fgsl_size_t), intent(in) ndim,
             integer(fgsl_size_t), intent(in) p,
             type(c_ptr), intent(in) params )
```

49.23.1.50 fgsl_multifit_gradient()

```
integer(fgsl_int) function fgsl_multifit_gradient (
             type(fgsl_matrix), intent(in) j,
             type(fgsl_vector), intent(in) f,
             type(fgsl_vector), intent(inout) g )
```

49.23.1.51 fgsl_multifit_linear()

```
integer(fgsl_int) function fgsl_multifit_linear (
             type(fgsl_matrix), intent(in) x,
             type(fgsl_vector), intent(in) y,
             type(fgsl_vector), intent(inout) c,
             type(fgsl_matrix), intent(inout) cov,
             real(fgsl_double), intent(inout) chisq,
             type(fgsl_multifit_linear_workspace), intent(inout) work )
```

49.23.1.52 fgsl_multifit_linear_alloc()

```
type(fgsl_multifit_linear_workspace) function fgsl_multifit_linear_alloc (
             integer(fgsl_size_t), intent(in) n,
             integer(fgsl_size_t), intent(in) p )
```

49.23.1.53 fgsl_multifit_linear_applyw()

```
integer(fgsl_int) function fgsl_multifit_linear_applyw (
             type(fgsl_matrix), intent(in) X,
             type(fgsl_vector), intent(in) w,
             type(fgsl_vector), intent(in) y,
             type(fgsl_matrix), intent(inout) WX,
             type(fgsl_vector), intent(inout) Wy )
```

49.23.1.54 fgsl_multifit_linear_bsvd()

```
integer(fgsl_int) function fgsl_multifit_linear_bsvd (
             type(fgsl_matrix), intent(in) X,
             type(fgsl_multifit_linear_workspace), intent(inout) work )
```

49.23.1.55 fgsl_multifit_linear_est()

```
integer(fgsl_int) function fgsl_multifit_linear_est (
             type(fgsl_vector), intent(in) x,
             type(fgsl_vector), intent(in) c,
             type(fgsl_matrix), intent(in) cov,
             real(fgsl_double), intent(inout) y,
             real(fgsl_double), intent(inout) y_err )
```

49.23.1.56 fgsl_multifit_linear_free()

```
subroutine fgsl_multifit_linear_free (
             type(fgsl_multifit_linear_workspace), intent(inout) w )
```

49.23.1.57 fgsl_multifit_linear_gcv()

```
integer(fgsl_int) function fgsl_multifit_linear_gcv (
             type(fgsl_vector), intent(in) y,
             type(fgsl_vector), intent(inout) reg_param,
             type(fgsl_vector), intent(inout) g,
             real(fgsl_double), intent(inout) lambda,
             real(fgsl_double), intent(inout) g_lambda,
             type(fgsl_multifit_linear_workspace), intent(inout) work )
```

49.23.1.58 fgsl_multifit_linear_gcv_calc()

```
real(fgsl_double) function fgsl_multifit_linear_gcv_calc (
             real(fgsl_double), intent(in) lambda,
             type(fgsl_vector), intent(in) uty,
             real(fgsl_double), intent(in) delta0,
             type(fgsl_multifit_linear_workspace), intent(inout) work )
```

49.23.1.59 fgsl_multifit_linear_gcv_curve()

```
integer(fgsl_int) function fgsl_multifit_linear_gcv_curve (
             type(fgsl_vector), intent(in) reg_param,
             type(fgsl_vector), intent(in) uty,
             real(fgsl_double), intent(in) delta0,
             type(fgsl_vector), intent(inout) g,
             type(fgsl_multifit_linear_workspace), intent(inout) work )
```

49.23.1.60 fgsl_multifit_linear_gcv_init()

```
integer(fgsl_int) function fgsl_multifit_linear_gcv_init (
             type(fgsl_vector), intent(in) y,
             type(fgsl_vector), intent(inout) reg_param,
             type(fgsl_vector), intent(inout) uty,
             real(fgsl_double), intent(inout) delta0,
             type(fgsl_multifit_linear_workspace), intent(inout) work )
```

49.23.1.61 fgsl_multifit_linear_gcv_min()

```
integer(fgsl_int) function fgsl_multifit_linear_gcv_min (
             type(fgsl_vector), intent(in) reg_param,
             type(fgsl_vector), intent(in) uty,
             real(fgsl_double), intent(in) delta0,
             type(fgsl_vector), intent(in) g,
             real(fgsl_double), intent(inout) lambda,
             type(fgsl_multifit_linear_workspace), intent(inout) work )
```

49.23.1.62 fgsl_multifit_linear_genform1()

```
integer(fgsl_int) function fgsl_multifit_linear_genform1 (
             type(fgsl_vector), intent(in) L,
             type(fgsl_vector), intent(in) cs,
             type(fgsl_vector), intent(inout) c,
             type(fgsl_multifit_linear_workspace), intent(inout) work )
```

49.23.1.63 fgsl_multifit_linear_genform2()

```
integer(fgsl_int) function fgsl_multifit_linear_genform2 (
             type(fgsl_matrix), intent(in) LQR,
             type(fgsl_vector), intent(in) Ltau,
             type(fgsl_matrix), intent(in) X,
             type(fgsl_vector), intent(in) y,
             type(fgsl_vector), intent(in) cs,
             type(fgsl_matrix), intent(in) M,
             type(fgsl_vector), intent(inout) c,
             type(fgsl_multifit_linear_workspace), intent(inout) work )
```

49.23.1.64 fgsl_multifit_linear_l_decomp()

```
integer(fgsl_int) function fgsl_multifit_linear_l_decomp (
             type(fgsl_matrix), intent(inout) L,
             type(fgsl_vector), intent(inout) tau )
```

49.23.1.65 fgsl_multifit_linear_lcorner()

```
integer(fgsl_int) function fgsl_multifit_linear_lcorner (
             type(fgsl_vector), intent(in) rho,
             type(fgsl_vector), intent(in) eta,
             integer(fgsl_size_t), intent(out) idx )
```

49.23.1.66 fgsl_multifit_linear_lcorner2()

```
integer(fgsl_int) function fgsl_multifit_linear_lcorner2 (
             type(fgsl_vector), intent(in) reg_param,
             type(fgsl_vector), intent(in) eta,
             integer(fgsl_size_t), intent(out) idx )
```

49.23.1.67 fgsl_multifit_linear_lcurve()

```
integer(fgsl_int) function fgsl_multifit_linear_lcurve (
             type(fgsl_vector), intent(in) y,
             type(fgsl_vector), intent(inout) reg_param,
             type(fgsl_vector), intent(inout) rho,
             type(fgsl_vector), intent(inout) eta,
             type(fgsl_multifit_linear_workspace), intent(inout) work )
```

49.23.1.68 fgsl_multifit_linear_lk()

```
integer(fgsl_int) function fgsl_multifit_linear_lk (
             integer(fgsl_size_t), intent(in) p,
             integer(fgsl_size_t), intent(in) k,
             type(fgsl_matrix), intent(inout) l )
```

49.23.1.69 fgsl_multifit_linear_lreg()

```
integer(fgsl_int) function fgsl_multifit_linear_lreg (
             real(fgsl_double), intent(in) smin,
             real(fgsl_double), intent(in) smax,
             type(fgsl_vector), intent(inout) reg_param )
```

49.23.1.70 fgsl_multifit_linear_lsobolev()

```
integer(fgsl_int) function fgsl_multifit_linear_lsobolev (
             integer(fgsl_size_t), intent(in) p,
             integer(fgsl_size_t), intent(in) kmax,
             type(fgsl_vector), intent(in) alpha,
             type(fgsl_matrix), intent(inout) l,
             type(fgsl_multifit_linear_workspace) work )
```

49.23.1.71 fgsl_multifit_linear_rank()

```
integer(fgsl_size_t) function fgsl_multifit_linear_rank (
             real(fgsl_double), intent(in) tol,
             type(fgsl_multifit_linear_workspace), intent(in) work )
```

49.23.1.72 fgsl_multifit_linear_rcond()

```
real(fgsl_double) function fgsl_multifit_linear_rcond (
             type(fgsl_multifit_linear_workspace), intent(in) w )
```

49.23.1.73 fgsl_multifit_linear_residuals()

```
integer(fgsl_int) function fgsl_multifit_linear_residuals (
             type(fgsl_matrix), intent(in) x,
             type(fgsl_vector), intent(in) y,
             type(fgsl_vector), intent(in) c,
             type(fgsl_vector), intent(inout) r )
```

49.23.1.74 fgsl_multifit_linear_solve()

```
integer(fgsl_int) function fgsl_multifit_linear_solve (
             real(fgsl_double), intent(in) lambda,
             type(fgsl_matrix), intent(in) X,
             type(fgsl_vector), intent(in) y,
             type(fgsl_vector), intent(inout) c,
             real(fgsl_double), intent(out) rnorm,
             real(fgsl_double), intent(out) snorm,
             type(fgsl_multifit_linear_workspace), intent(inout) work )
```

49.23.1.75 fgsl_multifit_linear_stdform1()

```
integer(fgsl_int) function fgsl_multifit_linear_stdform1 (
             type(fgsl_vector), intent(in) L,
             type(fgsl_matrix), intent(in) X,
             type(fgsl_vector), intent(in) y,
             type(fgsl_matrix), intent(inout) Xs,
             type(fgsl_vector), intent(inout) ys,
             type(fgsl_multifit_linear_workspace), intent(inout) work )
```

49.23.1.76 fgsl_multifit_linear_stdform2()

```
integer(fgsl_int) function fgsl_multifit_linear_stdform2 (
             type(fgsl_matrix), intent(in) LQR,
             type(fgsl_vector), intent(in) Ltau,
             type(fgsl_matrix), intent(in) X,
             type(fgsl_vector), intent(in) y,
             type(fgsl_matrix), intent(inout) Xs,
             type(fgsl_vector), intent(inout) ys,
             type(fgsl_matrix), intent(inout) M,
             type(fgsl_multifit_linear_workspace), intent(inout) work )
```

49.23.1.77 fgsl_multifit_linear_svd()

```
integer(fgsl_int) function fgsl_multifit_linear_svd (
             type(fgsl_matrix), intent(in) x,
             type(fgsl_multifit_linear_workspace), intent(inout) work )
```

49.23.1.78 fgsl_multifit_linear_tsvd()

```
integer(fgsl_int) function fgsl_multifit_linear_tsvd (
             type(fgsl_matrix), intent(in) x,
             type(fgsl_vector), intent(in) y,
             real(fgsl_double), intent(in) tol,
             type(fgsl_vector), intent(inout) c,
             type(fgsl_matrix), intent(inout) cov,
             real(fgsl_double), intent(inout) chisq,
             integer(fgsl_size_t), intent(inout) rank,
             type(fgsl_multifit_linear_workspace), intent(inout) work )
```

49.23.1.79 fgsl_multifit_linear_wgenform2()

```
integer(fgsl_int) function fgsl_multifit_linear_wgenform2 (
             type(fgsl_matrix), intent(in) LQR,
             type(fgsl_vector), intent(in) Ltau,
             type(fgsl_matrix), intent(in) X,
             type(fgsl_vector), intent(in) w,
             type(fgsl_vector), intent(in) y,
             type(fgsl_vector), intent(in) cs,
             type(fgsl_matrix), intent(in) M,
             type(fgsl_vector), intent(inout) c,
             type(fgsl_multifit_linear_workspace), intent(inout) work )
```

49.23.1.80 fgsl_multifit_linear_wstdform1()

```
integer(fgsl_int) function fgsl_multifit_linear_wstdform1 (
             type(fgsl_vector), intent(in) L,
             type(fgsl_matrix), intent(in) X,
             type(fgsl_vector), intent(in) w,
             type(fgsl_vector), intent(in) y,
             type(fgsl_matrix), intent(inout) Xs,
             type(fgsl_vector), intent(inout) ys,
             type(fgsl_multifit_linear_workspace), intent(inout) work )
```

49.23.1.81 fgsl_multifit_linear_wstdform2()

```
integer(fgsl_int) function fgsl_multifit_linear_wstdform2 (
             type(fgsl_matrix), intent(in) LQR,
             type(fgsl_vector), intent(in) Ltau,
             type(fgsl_matrix), intent(in) X,
             type(fgsl_vector), intent(in) w,
             type(fgsl_vector), intent(in) y,
             type(fgsl_matrix), intent(inout) Xs,
             type(fgsl_vector), intent(inout) ys,
             type(fgsl_matrix), intent(inout) M,
             type(fgsl_multifit_linear_workspace), intent(inout) work )
```

49.23.1.82 fgsl_multifit_robust()

```
integer(c_int) function fgsl_multifit_robust (
             type(fgsl_matrix), intent(in) X,
             type(fgsl_vector), intent(in) y,
             type(fgsl_vector), intent(inout) c,
             type(fgsl_matrix), intent(inout) cov,
             type(fgsl_multifit_robust_workspace), intent(inout) w )
```

49.23.1.83 fgsl_multifit_robust_alloc()

```
type(fgsl_multifit_robust_workspace) function fgsl_multifit_robust_alloc (
             type(fgsl_multifit_robust_type), intent(in) t,
             integer(fgsl_size_t), intent(in) n,
             integer(fgsl_size_t), intent(in) p )
```

49.23.1.84 fgsl_multifit_robust_est()

```
integer(c_int) function fgsl_multifit_robust_est (
             type(fgsl_vector), intent(in) x,
             type(fgsl_vector), intent(in) c,
             type(fgsl_matrix), intent(in) cov,
             real(c_double), intent(out) y,
             real(c_double), intent(out) y_err )
```

49.23.1.85 fgsl_multifit_robust_free()

```
subroutine fgsl_multifit_robust_free (
             type(fgsl_multifit_robust_workspace), intent(inout) w )
```

49.23.1.86 fgsl_multifit_robust_maxiter()

```
integer(fgsl_int) function fgsl_multifit_robust_maxiter (
             integer(fgsl_size_t), intent(in) maxiter,
             type(fgsl_multifit_robust_workspace), intent(inout) w )
```

49.23.1.87 fgsl_multifit_robust_name()

```
character(kind=fgsl_char,len=fgsl_strmax) function fgsl_multifit_robust_name (
             type(fgsl_multifit_robust_workspace), intent(in) w )
```

49.23.1.88 fgsl_multifit_robust_residuals()

```
integer(fgsl_int) function fgsl_multifit_robust_residuals (
             type(fgsl_matrix), intent(in) X,
             type(fgsl_vector), intent(in) y,
             type(fgsl_vector), intent(in) c,
             type(fgsl_vector), intent(inout) r,
             type(fgsl_multifit_robust_workspace), intent(inout) w )
```

49.23.1.89 fgsl_multifit_robust_statistics()

```
type(fgsl_multifit_robust_stats) function fgsl_multifit_robust_statistics (
             type(fgsl_multifit_robust_workspace), intent(in) w )
```

49.23.1.90 fgsl_multifit_robust_tune()

```
integer(fgsl_int) function fgsl_multifit_robust_tune (
             real(fgsl_double), intent(in) tune,
             type(fgsl_multifit_robust_workspace), intent(in) w )
```

49.23.1.91 fgsl_multifit_robust_weights()

```
integer(fgsl_int) function fgsl_multifit_robust_weights (
             type(fgsl_vector), intent(in) r,
             type(fgsl_vector), intent(inout) wts,
             type(fgsl_multifit_robust_workspace), intent(inout) w )
```

49.23.1.92 fgsl_multifit_status()

```
logical function fgsl_multifit_status (
            type(fgsl_multifit_linear_workspace), intent(in) multifit )
```

49.23.1.93 fgsl_multifit_test_delta()

```
integer(fgsl_int) function fgsl_multifit_test_delta (
            type(fgsl_vector), intent(in) dx,
            type(fgsl_vector), intent(in) x,
            real(fgsl_double), intent(in) epsabs,
            real(fgsl_double), intent(in) epsrel )
```

49.23.1.94 fgsl_multifit_test_gradient()

```
integer(fgsl_int) function fgsl_multifit_test_gradient (
            type(fgsl_vector), intent(in) g,
            real(fgsl_double), intent(in) epsabs )
```

49.23.1.95 fgsl_multifit_wlinear()

```
integer(fgsl_int) function fgsl_multifit_wlinear (
            type(fgsl_matrix), intent(in) x,
            type(fgsl_vector), intent(in) w,
            type(fgsl_vector), intent(in) y,
            type(fgsl_vector), intent(inout) c,
            type(fgsl_matrix), intent(inout) cov,
            real(fgsl_double), intent(inout) chisq,
            type(fgsl_multifit_linear_workspace), intent(inout) work )
```

49.23.1.96 fgsl_multifit_wlinear_svd()

```
integer(fgsl_int) function fgsl_multifit_wlinear_svd (
            type(fgsl_matrix), intent(in) x,
            type(fgsl_vector), intent(in) w,
            type(fgsl_vector), intent(in) y,
            real(fgsl_double), intent(in) tol,
            integer(fgsl_size_t), intent(inout) rank,
            type(fgsl_vector), intent(inout) c,
            type(fgsl_matrix), intent(inout) cov,
            real(fgsl_double), intent(inout) chisq,
            type(fgsl_multifit_linear_workspace), intent(inout) work )
```

49.23.1.97 fgsl_multifit_wlinear_tsvd()

```
integer(fgsl_int) function fgsl_multifit_wlinear_tsvd (
             type(fgsl_matrix), intent(in) x,
             type(fgsl_vector), intent(in) w,
             type(fgsl_vector), intent(in) y,
             real(fgsl_double), intent(in) tol,
             type(fgsl_vector), intent(inout) c,
             type(fgsl_matrix), intent(inout) cov,
             real(fgsl_double), intent(inout) chisq,
             integer(fgsl_size_t), intent(inout) rank,
             type(fgsl_multifit_linear_workspace), intent(inout) work )
```

49.23.1.98 fgsl_multifit_wlinear_usvd()

```
integer(fgsl_int) function fgsl_multifit_wlinear_usvd (
             type(fgsl_matrix), intent(in) x,
             type(fgsl_vector), intent(in) w,
             type(fgsl_vector), intent(in) y,
             real(fgsl_double), intent(in) tol,
             integer(fgsl_size_t), intent(inout) rank,
             type(fgsl_vector), intent(inout) c,
             type(fgsl_matrix), intent(inout) cov,
             real(fgsl_double), intent(inout) chisq,
             type(fgsl_multifit_linear_workspace), intent(inout) work )
```

49.24 api/multilarge.finc File Reference

Functions/Subroutines

- type(fgsl_multilarge_linear_workspace) function fgsl_multilarge_linear_alloc (T, p)
- subroutine fgsl_multilarge_linear_free (w)
- character(kind=fgsl_char, len=fgsl_strmax) function fgsl_multilarge_linear_name (w)
- integer(fgsl_int) function fgsl_multilarge_linear_reset (w)
- integer(fgsl_int) function fgsl_multilarge_linear_accumulate (X, y, w)
- integer(fgsl_int) function fgsl_multilarge_linear_solve (lambda, c, rnorm, snorm, w)
- integer(fgsl_int) function fgsl_multilarge_linear_rcond (rcond, w)
- integer(fgsl_int) function fgsl_multilarge_linear_lcurve (reg_param, rho, eta, w)
- integer(fgsl_int) function fgsl_multilarge_linear_wstdform1 (L, X, w, y, Xs, ys, work)
- integer(fgsl_int) function fgsl_multilarge_linear_stdform1 (L, X, y, Xs, ys, work)
- integer(fgsl_int) function fgsl_multilarge_linear_l_decomp (L, tau)
- integer(fgsl_int) function fgsl_multilarge_linear_wstdform2 (LQR, Ltau, X, w, y, Xs, ys, work)
- integer(fgsl_int) function fgsl_multilarge_linear_stdform2 (LQR, Ltau, X, y, Xs, ys, work)
- integer(fgsl_int) function fgsl_multilarge_linear_genform1 (L, cs, c, work)
- integer(fgsl_int) function fgsl_multilarge_linear_genform2 (LQR, Ltau, cs, c, work)

49.24.1 Function/Subroutine Documentation

49.24.1.1 fgsl_multilarge_linear_accumulate()

```
integer(fgsl_int) function fgsl_multilarge_linear_accumulate (
             type(fgsl_matrix), intent(inout) X,
             type(fgsl_vector), intent(inout) y,
             type(fgsl_multilarge_linear_workspace), intent(in) w )
```

49.24.1.2 fgsl_multilarge_linear_alloc()

```
type(fgsl_multilarge_linear_workspace) function fgsl_multilarge_linear_alloc (
             type(fgsl_multilarge_linear_type), intent(in) T,
             integer(fgsl_size_t), intent(in) p )
```

49.24.1.3 fgsl_multilarge_linear_free()

```
subroutine fgsl_multilarge_linear_free (
             type(fgsl_multilarge_linear_workspace), intent(inout) w )
```

49.24.1.4 fgsl_multilarge_linear_genform1()

```
integer(fgsl_int) function fgsl_multilarge_linear_genform1 (
             type(fgsl_vector), intent(in) L,
             type(fgsl_vector), intent(in) cs,
             type(fgsl_vector), intent(inout) c,
             type(fgsl_multilarge_linear_workspace), intent(inout) work )
```

49.24.1.5 fgsl_multilarge_linear_genform2()

```
integer(fgsl_int) function fgsl_multilarge_linear_genform2 (
             type(fgsl_matrix), intent(in) LQR,
             type(fgsl_vector), intent(in) Ltau,
             type(fgsl_vector), intent(in) cs,
             type(fgsl_vector), intent(inout) c,
             type(fgsl_multilarge_linear_workspace), intent(inout) work )
```

49.24.1.6 fgsl_multilarge_linear_l_decomp()

```
integer(fgsl_int) function fgsl_multilarge_linear_l_decomp (
             type(fgsl_matrix), intent(inout) L,
             type(fgsl_vector), intent(inout) tau )
```

49.24.1.7 fgsl_multilarge_linear_lcurve()

```
integer(fgsl_int) function fgsl_multilarge_linear_lcurve (
             type(fgsl_vector), intent(inout) reg_param,
             type(fgsl_vector), intent(inout) rho,
             type(fgsl_vector), intent(inout) eta,
             type(fgsl_multilarge_linear_workspace), intent(inout) w )
```

49.24.1.8 fgsl_multilarge_linear_name()

```
character(kind=fgsl_char,len=fgsl_strmax) function fgsl_multilarge_linear_name (
             type(fgsl_multilarge_linear_workspace), intent(in) w )
```

49.24.1.9 fgsl_multilarge_linear_rcond()

```
integer(fgsl_int) function fgsl_multilarge_linear_rcond (
             real(c_double), intent(out) rcond,
             type(fgsl_multilarge_linear_workspace), intent(inout) w )
```

49.24.1.10 fgsl_multilarge_linear_reset()

```
integer(fgsl_int) function fgsl_multilarge_linear_reset (
             type(fgsl_multilarge_linear_workspace), intent(in) w )
```

49.24.1.11 fgsl_multilarge_linear_solve()

```
integer(fgsl_int) function fgsl_multilarge_linear_solve (
             real(c_double), intent(in) lambda,
             type(fgsl_vector), intent(inout) c,
             real(c_double), intent(out) rnorm,
             real(c_double), intent(out) snorm,
             type(fgsl_multilarge_linear_workspace), intent(inout) w )
```

49.24.1.12 fgsl_multilarge_linear_stdform1()

```
integer(fgsl_int) function fgsl_multilarge_linear_stdform1 (
             type(fgsl_vector), intent(in) L,
             type(fgsl_vector), intent(in) X,
             type(fgsl_vector), intent(in) y,
             type(fgsl_matrix), intent(inout) Xs,
             type(fgsl_vector), intent(inout) ys,
             type(fgsl_multilarge_linear_workspace), intent(inout) work )
```

49.24.1.13 fgsl_multilarge_linear_stdform2()

```
integer(fgsl_int) function fgsl_multilarge_linear_stdform2 (
             type(fgsl_matrix), intent(in) LQR,
             type(fgsl_vector), intent(in) Ltau,
             type(fgsl_matrix), intent(in) X,
             type(fgsl_vector), intent(in) y,
             type(fgsl_matrix), intent(inout) Xs,
             type(fgsl_vector), intent(inout) ys,
             type(fgsl_multilarge_linear_workspace), intent(inout) work )
```

49.24.1.14 fgsl_multilarge_linear_wstdform1()

```
integer(fgsl_int) function fgsl_multilarge_linear_wstdform1 (
             type(fgsl_vector), intent(in) L,
             type(fgsl_vector), intent(in) X,
             type(fgsl_vector), intent(in) w,
             type(fgsl_vector), intent(in) y,
             type(fgsl_matrix), intent(inout) Xs,
             type(fgsl_vector), intent(inout) ys,
             type(fgsl_multilarge_linear_workspace), intent(inout) work )
```

49.24.1.15 fgsl_multilarge_linear_wstdform2()

```
integer(fgsl_int) function fgsl_multilarge_linear_wstdform2 (
             type(fgsl_matrix), intent(in) LQR,
             type(fgsl_vector), intent(in) Ltau,
             type(fgsl_matrix), intent(in) X,
             type(fgsl_vector), intent(in) w,
             type(fgsl_vector), intent(in) y,
             type(fgsl_matrix), intent(inout) Xs,
             type(fgsl_vector), intent(inout) ys,
             type(fgsl_multilarge_linear_workspace), intent(inout) work )
```

49.25 api/multimin.finc File Reference

Functions/Subroutines

- type(fgsl_multimin_function) function fgsl_multimin_function_init (func, ndim, params)
- type(fgsl_multimin_function_fdf) function fgsl_multimin_function_fdf_init (func, dfunc, fdfunc, ndim, params)
- subroutine fgsl_multimin_function_free (fun)
- subroutine fgsl_multimin_function_fdf_free (fun)
- type(fgsl_multimin_fminimizer) function fgsl_multimin_fminimizer_alloc (t, n)
- type(fgsl_multimin_fdfminimizer) function fgsl_multimin_fdfminimizer_alloc (t, n)
- subroutine fgsl_multimin_fminimizer_free (s)
- subroutine fgsl_multimin_fdfminimizer_free (s)
- integer(fgsl_int) function fgsl_multimin_fminimizer_set (s, f, x, step)

- integer(fgsl_int) function fgsl_multimin_fdfminimizer_set (s, fdf, x, step, tol)
- character(kind=fgsl_char, len=fgsl_strmax) function fgsl_multimin_fminimizer_name (s)
- character(kind=fgsl_char, len=fgsl_strmax) function fgsl_multimin_fdfminimizer_name (s)
- integer(fgsl_int) function fgsl_multimin_fminimizer_iterate (s)
- integer(fgsl_int) function fgsl_multimin_fdfminimizer_iterate (s)
- type(fgsl_vector) function fgsl_multimin_fminimizer_x (s)
- type(fgsl_vector) function fgsl_multimin_fdfminimizer_x (s)
- real(fgsl_double) function fgsl_multimin_fminimizer_minimum (s)
- real(fgsl_double) function fgsl_multimin_fdfminimizer_minimum (s)
- type(fgsl_vector) function fgsl_multimin_fdfminimizer_gradient (s)
- real(fgsl_double) function fgsl_multimin_fminimizer_size (s)
- integer(fgsl_int) function fgsl_multimin_fdfminimizer_restart (s)
- integer(fgsl_int) function fgsl_multimin_test_gradient (g, epsabs)
- integer(fgsl_int) function fgsl_multimin_test_size (size, epsabs)
- logical function fgsl_multimin_fminimizer_status (s)
- logical function fgsl_multimin_fdfminimizer_status (s)

49.25.1 Function/Subroutine Documentation

49.25.1.1 fgsl_multimin_fdfminimizer_alloc()

```
type(fgsl_multimin_fdfminimizer) function fgsl_multimin_fdfminimizer_alloc (
             type(fgsl_multimin_fdfminimizer_type), intent(in) t,
             integer(fgsl_size_t), intent(in) n )
```

49.25.1.2 fgsl_multimin_fdfminimizer_free()

```
subroutine fgsl_multimin_fdfminimizer_free (
             type(fgsl_multimin_fdfminimizer), intent(inout) s )
```

49.25.1.3 fgsl_multimin_fdfminimizer_gradient()

```
type(fgsl_vector) function fgsl_multimin_fdfminimizer_gradient (
             type(fgsl_multimin_fdfminimizer), intent(in) s )
```

49.25.1.4 fgsl_multimin_fdfminimizer_iterate()

```
integer(fgsl_int) function fgsl_multimin_fdfminimizer_iterate (
             type(fgsl_multimin_fdfminimizer), intent(in) s )
```

49.25.1.5 fgsl_multimin_fdfminimizer_minimum()

```
real(fgsl_double) function fgsl_multimin_fdfminimizer_minimum (
            type(fgsl_multimin_fdfminimizer), intent(in) s )
```

49.25.1.6 fgsl_multimin_fdfminimizer_name()

```
character(kind=fgsl_char,len=fgsl_strmax) function fgsl_multimin_fdfminimizer_name (
            type(fgsl_multimin_fdfminimizer), intent(in) s )
```

49.25.1.7 fgsl_multimin_fdfminimizer_restart()

```
integer(fgsl_int) function fgsl_multimin_fdfminimizer_restart (
            type(fgsl_multimin_fdfminimizer), intent(in) s )
```

49.25.1.8 fgsl_multimin_fdfminimizer_set()

```
integer(fgsl_int) function fgsl_multimin_fdfminimizer_set (
            type(fgsl_multimin_fdfminimizer), intent(inout) s,
            type(fgsl_multimin_function_fdf), intent(in) fdf,
            type(fgsl_vector), intent(in) x,
            real(fgsl_double), intent(in) step,
            real(fgsl_double), intent(in) tol )
```

49.25.1.9 fgsl_multimin_fdfminimizer_status()

```
logical function fgsl_multimin_fdfminimizer_status (
            type(fgsl_multimin_fdfminimizer), intent(in) s )
```

49.25.1.10 fgsl_multimin_fdfminimizer_x()

```
type(fgsl_vector) function fgsl_multimin_fdfminimizer_x (
            type(fgsl_multimin_fdfminimizer), intent(in) s )
```

49.25.1.11 fgsl_multimin_fminimizer_alloc()

```
type(fgsl_multimin_fminimizer) function fgsl_multimin_fminimizer_alloc (
             type(fgsl_multimin_fminimizer_type), intent(in) t,
             integer(fgsl_size_t), intent(in) n )
```

49.25.1.12 fgsl_multimin_fminimizer_free()

```
subroutine fgsl_multimin_fminimizer_free (
             type(fgsl_multimin_fminimizer), intent(inout) s )
```

49.25.1.13 fgsl_multimin_fminimizer_iterate()

```
integer(fgsl_int) function fgsl_multimin_fminimizer_iterate (
             type(fgsl_multimin_fminimizer), intent(in) s )
```

49.25.1.14 fgsl_multimin_fminimizer_minimum()

```
real(fgsl_double) function fgsl_multimin_fminimizer_minimum (
             type(fgsl_multimin_fminimizer), intent(in) s )
```

49.25.1.15 fgsl_multimin_fminimizer_name()

```
character(kind=fgsl_char,len=fgsl_strmax) function fgsl_multimin_fminimizer_name (
             type(fgsl_multimin_fminimizer), intent(in) s )
```

49.25.1.16 fgsl_multimin_fminimizer_set()

```
integer(fgsl_int) function fgsl_multimin_fminimizer_set (
             type(fgsl_multimin_fminimizer), intent(inout) s,
             type(fgsl_multimin_function), intent(in) f,
             type(fgsl_vector), intent(in) x,
             type(fgsl_vector), intent(in) step )
```

49.25.1.17 fgsl_multimin_fminimizer_size()

```
real(fgsl_double) function fgsl_multimin_fminimizer_size (
             type(fgsl_multimin_fminimizer), intent(in) s )
```

49.25.1.18 fgsl_multimin_fminimizer_status()

```
logical function fgsl_multimin_fminimizer_status (
             type(fgsl_multimin_fminimizer), intent(in) s )
```

49.25.1.19 fgsl_multimin_fminimizer_x()

```
type(fgsl_vector) function fgsl_multimin_fminimizer_x (
             type(fgsl_multimin_fminimizer), intent(in) s )
```

49.25.1.20 fgsl_multimin_function_fdf_free()

```
subroutine fgsl_multimin_function_fdf_free (
             type(fgsl_multimin_function_fdf), intent(inout) fun )
```

49.25.1.21 fgsl_multimin_function_fdf_init()

```
type(fgsl_multimin_function_fdf) function fgsl_multimin_function_fdf_init (
              func,
              dfunc,
              fdfunc,
             integer(fgsl_size_t), intent(in) ndim,
             type(c_ptr), intent(in) params )
```

49.25.1.22 fgsl_multimin_function_free()

```
subroutine fgsl_multimin_function_free (
             type(fgsl_multimin_function), intent(inout) fun )
```

49.25.1.23 fgsl_multimin_function_init()

```
type(fgsl_multimin_function) function fgsl_multimin_function_init (
              func,
             integer(fgsl_size_t), intent(in) ndim,
             type(c_ptr), intent(in) params )
```

49.25.1.24 fgsl_multimin_test_gradient()

```
integer(fgsl_int) function fgsl_multimin_test_gradient (
             type(fgsl_vector), intent(in) g,
             real(fgsl_double), intent(in) epsabs )
```

49.25.1.25 fgsl_multimin_test_size()

```
integer(fgsl_int) function fgsl_multimin_test_size (
             real(fgsl_double), intent(in) size,
             real(fgsl_double), intent(in) epsabs )
```

49.26 api/multiroots.finc File Reference

Functions/Subroutines

- type(fgsl_multiroot_function) function fgsl_multiroot_function_init (func, ndim, params)
- type(fgsl_multiroot_function_fdf) function fgsl_multiroot_function_fdf_init (func, dfunc, fdfunc, ndim, params)
- subroutine fgsl_multiroot_function_free (fun)
- subroutine fgsl_multiroot_function_fdf_free (fun)
- type(fgsl_multiroot_fsolver) function fgsl_multiroot_fsolver_alloc (t, n)
- type(fgsl_multiroot_fdfsolver) function fgsl_multiroot_fdfsolver_alloc (t, n)
- subroutine fgsl_multiroot_fsolver_free (s)
- subroutine fgsl_multiroot_fdfsolver_free (s)
- integer(fgsl_int) function fgsl_multiroot_fsolver_set (s, f, x)
- integer(fgsl_int) function fgsl_multiroot_fdfsolver_set (s, fdf, x)
- character(kind=fgsl_char, len=fgsl_strmax) function fgsl_multiroot_fsolver_name (s)
- character(kind=fgsl_char, len=fgsl_strmax) function fgsl_multiroot_fdfsolver_name (s)
- integer(fgsl_int) function fgsl_multiroot_fsolver_iterate (s)
- integer(fgsl_int) function fgsl_multiroot_fdfsolver_iterate (s)
- type(fgsl_vector) function fgsl_multiroot_fsolver_root (s)
- type(fgsl_vector) function fgsl_multiroot_fdfsolver_root (s)
- type(fgsl_vector) function fgsl_multiroot_fsolver_f (s)
- type(fgsl_vector) function fgsl_multiroot_fdfsolver_f (s)
- type(fgsl_vector) function fgsl_multiroot_fsolver_dx (s)
- type(fgsl_vector) function fgsl_multiroot_fdfsolver_dx (s)
- integer(fgsl_int) function fgsl_multiroot_test_delta (dx, x, epsabs, epsrel)
- integer(fgsl_int) function fgsl_multiroot_test_residual (f, epsabs)
- logical function fgsl_multiroot_fsolver_status (s)
- logical function fgsl_multiroot_fdfsolver_status (s)

49.26.1 Function/Subroutine Documentation

49.26.1.1 fgsl_multiroot_fdfsolver_alloc()

```
type(fgsl_multiroot_fdfsolver) function fgsl_multiroot_fdfsolver_alloc (
            type(fgsl_multiroot_fdfsolver_type), intent(in) t,
            integer(fgsl_size_t), intent(in) n )
```

49.26.1.2 fgsl_multiroot_fdfsolver_dx()

```
type(fgsl_vector) function fgsl_multiroot_fdfsolver_dx (
            type(fgsl_multiroot_fdfsolver), intent(in) s )
```

49.26.1.3 fgsl_multiroot_fdfsolver_f()

```
type(fgsl_vector) function fgsl_multiroot_fdfsolver_f (
            type(fgsl_multiroot_fdfsolver), intent(in) s )
```

49.26.1.4 fgsl_multiroot_fdfsolver_free()

```
subroutine fgsl_multiroot_fdfsolver_free (
            type(fgsl_multiroot_fdfsolver), intent(inout) s )
```

49.26.1.5 fgsl_multiroot_fdfsolver_iterate()

```
integer(fgsl_int) function fgsl_multiroot_fdfsolver_iterate (
            type(fgsl_multiroot_fdfsolver), intent(in) s )
```

49.26.1.6 fgsl_multiroot_fdfsolver_name()

```
character(kind=fgsl_char,len=fgsl_strmax) function fgsl_multiroot_fdfsolver_name (
            type(fgsl_multiroot_fdfsolver), intent(in) s )
```

49.26.1.7 fgsl_multiroot_fdfsolver_root()

```
type(fgsl_vector) function fgsl_multiroot_fdfsolver_root (
            type(fgsl_multiroot_fdfsolver), intent(in) s )
```

49.26.1.8 fgsl_multiroot_fdfsolver_set()

```
integer(fgsl_int) function fgsl_multiroot_fdfsolver_set (
            type(fgsl_multiroot_fdfsolver), intent(inout) s,
            type(fgsl_multiroot_function_fdf), intent(in) fdf,
            type(fgsl_vector), intent(in) x )
```

49.26.1.9 fgsl_multiroot_fdfsolver_status()

```
logical function fgsl_multiroot_fdfsolver_status (
            type(fgsl_multiroot_fdfsolver), intent(in) s )
```

49.26.1.10 fgsl_multiroot_fsolver_alloc()

```
type(fgsl_multiroot_fsolver) function fgsl_multiroot_fsolver_alloc (
            type(fgsl_multiroot_fsolver_type), intent(in) t,
            integer(fgsl_size_t), intent(in) n )
```

49.26.1.11 fgsl_multiroot_fsolver_dx()

```
type(fgsl_vector) function fgsl_multiroot_fsolver_dx (
            type(fgsl_multiroot_fsolver), intent(in) s )
```

49.26.1.12 fgsl_multiroot_fsolver_f()

```
type(fgsl_vector) function fgsl_multiroot_fsolver_f (
            type(fgsl_multiroot_fsolver), intent(in) s )
```

49.26.1.13 fgsl_multiroot_fsolver_free()

```
subroutine fgsl_multiroot_fsolver_free (
             type(fgsl_multiroot_fsolver), intent(inout) s )
```

49.26.1.14 fgsl_multiroot_fsolver_iterate()

```
integer(fgsl_int) function fgsl_multiroot_fsolver_iterate (
             type(fgsl_multiroot_fsolver), intent(in) s )
```

49.26.1.15 fgsl_multiroot_fsolver_name()

```
character(kind=fgsl_char,len=fgsl_strmax) function fgsl_multiroot_fsolver_name (
             type(fgsl_multiroot_fsolver), intent(in) s )
```

49.26.1.16 fgsl_multiroot_fsolver_root()

```
type(fgsl_vector) function fgsl_multiroot_fsolver_root (
             type(fgsl_multiroot_fsolver), intent(in) s )
```

49.26.1.17 fgsl_multiroot_fsolver_set()

```
integer(fgsl_int) function fgsl_multiroot_fsolver_set (
             type(fgsl_multiroot_fsolver), intent(inout) s,
             type(fgsl_multiroot_function), intent(in) f,
             type(fgsl_vector), intent(in) x )
```

49.26.1.18 fgsl_multiroot_fsolver_status()

```
logical function fgsl_multiroot_fsolver_status (
             type(fgsl_multiroot_fsolver), intent(in) s )
```

49.26.1.19 fgsl_multiroot_function_fdf_free()

```
subroutine fgsl_multiroot_function_fdf_free (
             type(fgsl_multiroot_function_fdf), intent(inout) fun )
```

49.26.1.20 fgsl_multiroot_function_fdf_init()

```
type(fgsl_multiroot_function_fdf) function fgsl_multiroot_function_fdf_init (
              func,
              dfunc,
              fdfunc,
             integer(fgsl_size_t), intent(in) ndim,
             type(c_ptr), intent(in) params )
```

49.26.1.21 fgsl_multiroot_function_free()

```
subroutine fgsl_multiroot_function_free (
             type(fgsl_multiroot_function), intent(inout) fun )
```

49.26.1.22 fgsl_multiroot_function_init()

```
type(fgsl_multiroot_function) function fgsl_multiroot_function_init (
              func,
             integer(fgsl_size_t), intent(in) ndim,
             type(c_ptr), intent(in) params )
```

49.26.1.23 fgsl_multiroot_test_delta()

```
integer(fgsl_int) function fgsl_multiroot_test_delta (
             type(fgsl_vector), intent(in) dx,
             type(fgsl_vector), intent(in) x,
             real(fgsl_double), intent(in) epsabs,
             real(fgsl_double), intent(in) epsrel )
```

49.26.1.24 fgsl_multiroot_test_residual()

```
integer(fgsl_int) function fgsl_multiroot_test_residual (
             type(fgsl_vector), intent(in) f,
             real(fgsl_double), intent(in) epsabs )
```

49.27 api/nlfit.finc File Reference

Functions/Subroutines

- type(fgsl_multifit_nlinear_type) function fgsl_multifit_nlinear_setup (s)
- type(fgsl_multilarge_nlinear_type) function fgsl_multilarge_nlinear_setup (s)
- type(fgsl_multifit_nlinear_workspace) function fgsl_multifit_nlinear_alloc (t, params, n, p)
- type(fgsl_multilarge_nlinear_workspace) function fgsl_multilarge_nlinear_alloc (t, params, n, p)
- type(fgsl_multifit_nlinear_parameters) function fgsl_multifit_nlinear_default_parameters ()
- type(fgsl_multilarge_nlinear_parameters) function fgsl_multilarge_nlinear_default_parameters ()
- integer(fgsl_int) function fgsl_multifit_nlinear_init (x, fdf, w)
- integer(fgsl_int) function fgsl_multifit_nlinear_winit (x, wts, fdf, w)
- integer(fgsl_int) function fgsl_multilarge_nlinear_init (x, fdf, w)
- integer(fgsl_int) function fgsl_multilarge_nlinear_winit (x, wts, fdf, w)
- subroutine fgsl_multifit_nlinear_free (w)
- subroutine fgsl_multilarge_nlinear_free (w)
- character(kind=fgsl_char, len=fgsl_strmax) function fgsl_multifit_nlinear_name (w)
- character(kind=fgsl_char, len=fgsl_strmax) function fgsl_multilarge_nlinear_name (w)
- character(kind=fgsl_char, len=fgsl_strmax) function fgsl_multifit_nlinear_trs_name (w)
- character(kind=fgsl_char, len=fgsl_strmax) function fgsl_multilarge_nlinear_trs_name (w)
- integer(fgsl_int) function fgsl_multifit_nlinear_iterate (w)
- integer(fgsl_int) function fgsl_multilarge_nlinear_iterate (w)
- type(fgsl_vector) function fgsl_multifit_nlinear_position (w)
- type(fgsl_vector) function fgsl_multilarge_nlinear_position (w)
- type(fgsl_vector) function fgsl_multifit_nlinear_residual (w)
- type(fgsl_vector) function fgsl_multilarge_nlinear_residual (w)
- type(fgsl_matrix) function fgsl_multifit_nlinear_jac (w)
- integer(fgsl_size_t) function fgsl_multifit_nlinear_niter (w)
- integer(fgsl_size_t) function fgsl_multilarge_nlinear_niter (w)
- integer(fgsl_int) function fgsl_multifit_nlinear_rcond (rcond, w)
- integer(fgsl_int) function fgsl_multilarge_nlinear_rcond (rcond, w)
- integer(fgsl_int) function fgsl_multifit_nlinear_test (xtol, gtol, ftol, info, w)
- integer(fgsl_int) function fgsl_multilarge_nlinear_test (xtol, gtol, ftol, info, w)
- integer(fgsl_int) function fgsl_multifit_nlinear_driver (maxiter, xtol, gtol, ftol, callback, callback_params, info, w)
- integer(fgsl_int) function fgsl_multilarge_nlinear_driver (maxiter, xtol, gtol, ftol, callback, callback_params, info, w)
- integer(fgsl_int) function fgsl_multifit_nlinear_covar (j, epsrel, covar)
- integer(fgsl_int) function fgsl_multilarge_nlinear_covar (covar, w)
- type(fgsl_multifit_nlinear_fdf) function fgsl_multifit_nlinear_fdf_init (ndim, p, params, func, dfunc, fvv)
- subroutine fgsl_multifit_nlinear_fdf_get (fdf, func, dfunc, fvv, n, p, params, nevalf, nevaldf, nevalfvv)
- subroutine fgsl_multifit_nlinear_fdf_free (fun)
- logical function fgsl_multifit_nlinear_status (s)
- subroutine fgsl_multifit_nlinear_parameters_set (params, trs, scale, solver, fdtype, factor_up, factor_down, avmax, h_df, h_fvv)
- type(fgsl_multilarge_nlinear_fdf) function fgsl_multilarge_nlinear_fdf_init (ndim, p, params, func, dfunc, fvv)
- subroutine fgsl_multilarge_nlinear_fdf_free (fun)
- subroutine fgsl_multilarge_nlinear_fdf_get (fdf, func, dfunc, fvv, n, p, params, nevalf, nevaldfu, nevaldf2, nevalfvv)
- subroutine fgsl_multilarge_nlinear_parameters_set (params, trs, scale, solver, fdtype, factor_up, factor_down, avmax, h_df, h_fvv, max_iter, tol)

49.27.1 Function/Subroutine Documentation

49.27.1.1 fgsl_multifit_nlinear_alloc()

```
type(fgsl_multifit_nlinear_workspace) function fgsl_multifit_nlinear_alloc (
             type(fgsl_multifit_nlinear_type), intent(in) t,
             type(fgsl_multifit_nlinear_parameters), intent(in) params,
             integer(fgsl_size_t), intent(in) n,
             integer(fgsl_size_t), intent(in) p )
```

49.27.1.2 fgsl_multifit_nlinear_covar()

```
integer(fgsl_int) function fgsl_multifit_nlinear_covar (
             type(fgsl_matrix), intent(in) j,
             real(fgsl_double), intent(in) epsrel,
             type(fgsl_matrix), intent(inout) covar )
```

49.27.1.3 fgsl_multifit_nlinear_default_parameters()

```
type(fgsl_multifit_nlinear_parameters) function fgsl_multifit_nlinear_default_parameters
```

49.27.1.4 fgsl_multifit_nlinear_driver()

```
integer(fgsl_int) function fgsl_multifit_nlinear_driver (
             integer(fgsl_size_t), intent(in) maxiter,
             real(fgsl_double), intent(in) xtol,
             real(fgsl_double), intent(in) gtol,
             real(fgsl_double), intent(in) ftol,
             procedure(fgsl_nlinear_callback), optional callback,
             type(c_ptr), value callback_params,
             integer(fgsl_int), intent(inout) info,
             type(fgsl_multifit_nlinear_workspace), intent(in) w )
```

49.27.1.5 fgsl_multifit_nlinear_fdf_free()

```
subroutine fgsl_multifit_nlinear_fdf_free (
             type(fgsl_multifit_nlinear_fdf), intent(inout) fun )
```

49.27.1.6 fgsl_multifit_nlinear_fdf_get()

```
subroutine fgsl_multifit_nlinear_fdf_get (
             type(fgsl_multifit_nlinear_fdf), intent(in) fdf,
             procedure(fgsl_nlinear_fdf_func), optional, pointer func,
             procedure(fgsl_nlinear_fdf_dfunc), optional, pointer dfunc,
             procedure(fgsl_nlinear_fdf_fvv), optional, pointer fvv,
             integer(fgsl_size_t), intent(out), optional n,
             integer(fgsl_size_t), intent(out), optional p,
             type(c_ptr), intent(out), optional params,
             integer(fgsl_size_t), intent(out), optional nevalf,
             integer(fgsl_size_t), intent(out), optional nevaldf,
             integer(fgsl_size_t), intent(out), optional nevalfvv )
```

49.27.1.7 fgsl_multifit_nlinear_fdf_init()

```
type(fgsl_multifit_nlinear_fdf) function fgsl_multifit_nlinear_fdf_init (
             integer(fgsl_size_t), intent(in) ndim,
             integer(fgsl_size_t), intent(in) p,
             type(c_ptr), intent(in) params,
             procedure(fgsl_nlinear_fdf_func), optional func,
             procedure(fgsl_nlinear_fdf_dfunc), optional dfunc,
             procedure(fgsl_nlinear_fdf_fvv), optional fvv )
```

49.27.1.8 fgsl_multifit_nlinear_free()

```
subroutine fgsl_multifit_nlinear_free (
             type(fgsl_multifit_nlinear_workspace), intent(inout) w )
```

49.27.1.9 fgsl_multifit_nlinear_init()

```
integer(fgsl_int) function fgsl_multifit_nlinear_init (
             type(fgsl_vector), intent(in) x,
             type(fgsl_multifit_nlinear_fdf), intent(in) fdf,
             type(fgsl_multifit_nlinear_workspace), intent(inout) w )
```

49.27.1.10 fgsl_multifit_nlinear_iterate()

```
integer(fgsl_int) function fgsl_multifit_nlinear_iterate (
             type(fgsl_multifit_nlinear_workspace), intent(inout) w )
```

49.27.1.11 fgsl_multifit_nlinear_jac()

```
type(fgsl_matrix) function fgsl_multifit_nlinear_jac (
             type(fgsl_multifit_nlinear_workspace), intent(in) w )
```

49.27.1.12 fgsl_multifit_nlinear_name()

```
character(kind=fgsl_char,len=fgsl_strmax) function fgsl_multifit_nlinear_name (
             type(fgsl_multifit_nlinear_workspace), intent(in) w )
```

49.27.1.13 fgsl_multifit_nlinear_niter()

```
integer(fgsl_size_t) function fgsl_multifit_nlinear_niter (
             type(fgsl_multifit_nlinear_workspace), intent(in) w )
```

49.27.1.14 fgsl_multifit_nlinear_parameters_set()

```
subroutine fgsl_multifit_nlinear_parameters_set (
             type(fgsl_multifit_nlinear_parameters) params,
             type(fgsl_multifit_nlinear_trs), optional trs,
             type(fgsl_multifit_nlinear_scale), optional scale,
             type(fgsl_multifit_nlinear_solver), optional solver,
             integer(fgsl_int), optional fdtype,
             real(c_double), optional factor_up,
             real(c_double), optional factor_down,
             real(c_double), optional avmax,
             real(c_double), optional h_df,
             real(c_double), optional h_fvv )
```

49.27.1.15 fgsl_multifit_nlinear_position()

```
type(fgsl_vector) function fgsl_multifit_nlinear_position (
             type(fgsl_multifit_nlinear_workspace), intent(in) w )
```

49.27.1.16 fgsl_multifit_nlinear_rcond()

```
integer(fgsl_int) function fgsl_multifit_nlinear_rcond (
             real(fgsl_double), intent(inout) rcond,
             type(fgsl_multifit_nlinear_workspace), intent(in) w )
```

49.27.1.17 fgsl_multifit_nlinear_residual()

```
type(fgsl_vector) function fgsl_multifit_nlinear_residual (
             type(fgsl_multifit_nlinear_workspace), intent(in) w )
```

49.27.1.18 fgsl_multifit_nlinear_setup()

```
type(fgsl_multifit_nlinear_type) function fgsl_multifit_nlinear_setup (
             character(kind=fgsl_char, len=*) s )
```

49.27.1.19 fgsl_multifit_nlinear_status()

```
logical function fgsl_multifit_nlinear_status (
             type(fgsl_multifit_nlinear_workspace), intent(in) s )
```

49.27.1.20 fgsl_multifit_nlinear_test()

```
integer(fgsl_int) function fgsl_multifit_nlinear_test (
             real(fgsl_double), intent(in) xtol,
             real(fgsl_double), intent(in) gtol,
             real(fgsl_double), intent(in) ftol,
             integer(fgsl_int), intent(inout) info,
             type(fgsl_multifit_nlinear_workspace), intent(in) w )
```

49.27.1.21 fgsl_multifit_nlinear_trs_name()

```
character(kind=fgsl_char,len=fgsl_strmax) function fgsl_multifit_nlinear_trs_name (
             type(fgsl_multifit_nlinear_workspace), intent(in) w )
```

49.27.1.22 fgsl_multifit_nlinear_winit()

```
integer(fgsl_int) function fgsl_multifit_nlinear_winit (
             type(fgsl_vector), intent(in) x,
             type(fgsl_vector), intent(in) wts,
             type(fgsl_multifit_nlinear_fdf), intent(in) fdf,
             type(fgsl_multifit_nlinear_workspace), intent(inout) w )
```

49.27.1.23 fgsl_multilarge_nlinear_alloc()

```
type(fgsl_multilarge_nlinear_workspace) function fgsl_multilarge_nlinear_alloc (
             type(fgsl_multilarge_nlinear_type), intent(in) t,
             type(fgsl_multilarge_nlinear_parameters), intent(in) params,
             integer(fgsl_size_t), intent(in) n,
             integer(fgsl_size_t), intent(in) p )
```

49.27.1.24 fgsl_multilarge_nlinear_covar()

```
integer(fgsl_int) function fgsl_multilarge_nlinear_covar (
             type(fgsl_matrix), intent(inout) covar,
             type(fgsl_multilarge_nlinear_workspace), intent(in) w )
```

49.27.1.25 fgsl_multilarge_nlinear_default_parameters()

```
type(fgsl_multilarge_nlinear_parameters) function fgsl_multilarge_nlinear_default_parameters
```

49.27.1.26 fgsl_multilarge_nlinear_driver()

```
integer(fgsl_int) function fgsl_multilarge_nlinear_driver (
             integer(fgsl_size_t), intent(in) maxiter,
             real(fgsl_double), intent(in) xtol,
             real(fgsl_double), intent(in) gtol,
             real(fgsl_double), intent(in) ftol,
             procedure(fgsl_nlinear_callback), optional callback,
             type(c_ptr), value callback_params,
             integer(fgsl_int), intent(inout) info,
             type(fgsl_multilarge_nlinear_workspace), intent(in) w )
```

49.27.1.27 fgsl_multilarge_nlinear_fdf_free()

```
subroutine fgsl_multilarge_nlinear_fdf_free (
             type(fgsl_multilarge_nlinear_fdf), intent(inout) fun )
```

49.27.1.28 fgsl_multilarge_nlinear_fdf_get()

```
subroutine fgsl_multilarge_nlinear_fdf_get (
             type(fgsl_multilarge_nlinear_fdf), intent(in) fdf,
             procedure(fgsl_nlinear_fdf_func), optional, pointer func,
             procedure(fgsl_nlinear_fdf_dlfunc), optional, pointer dfunc,
             procedure(fgsl_nlinear_fdf_fvv), optional, pointer fvv,
             integer(fgsl_size_t), intent(out), optional n,
             integer(fgsl_size_t), intent(out), optional p,
             type(c_ptr), intent(out), optional params,
             integer(fgsl_size_t), intent(out), optional nevalf,
             integer(fgsl_size_t), intent(out), optional nevaldfu,
             integer(fgsl_size_t), intent(out), optional nevaldf2,
             integer(fgsl_size_t), intent(out), optional nevalfvv )
```

49.27.1.29 fgsl_multilarge_nlinear_fdf_init()

```
type(fgsl_multilarge_nlinear_fdf) function fgsl_multilarge_nlinear_fdf_init (
             integer(fgsl_size_t), intent(in) ndim,
             integer(fgsl_size_t), intent(in) p,
             type(c_ptr), intent(in) params,
             procedure(fgsl_nlinear_fdf_func), optional func,
             procedure(fgsl_nlinear_fdf_dlfunc), optional dfunc,
             procedure(fgsl_nlinear_fdf_fvv), optional fvv )
```

49.27.1.30 fgsl_multilarge_nlinear_free()

```
subroutine fgsl_multilarge_nlinear_free (
             type(fgsl_multilarge_nlinear_workspace), intent(inout) w )
```

49.27.1.31 fgsl_multilarge_nlinear_init()

```
integer(fgsl_int) function fgsl_multilarge_nlinear_init (
             type(fgsl_vector), intent(in) x,
             type(fgsl_multilarge_nlinear_fdf), intent(in) fdf,
             type(fgsl_multilarge_nlinear_workspace), intent(inout) w )
```

49.27.1.32 fgsl_multilarge_nlinear_iterate()

```
integer(fgsl_int) function fgsl_multilarge_nlinear_iterate (
             type(fgsl_multilarge_nlinear_workspace), intent(inout) w )
```

49.27.1.33 fgsl_multilarge_nlinear_name()

```
character(kind=fgsl_char,len=fgsl_strmax) function fgsl_multilarge_nlinear_name (
            type(fgsl_multilarge_nlinear_workspace), intent(in) w )
```

49.27.1.34 fgsl_multilarge_nlinear_niter()

```
integer(fgsl_size_t) function fgsl_multilarge_nlinear_niter (
            type(fgsl_multilarge_nlinear_workspace), intent(in) w )
```

49.27.1.35 fgsl_multilarge_nlinear_parameters_set()

```
subroutine fgsl_multilarge_nlinear_parameters_set (
            type(fgsl_multilarge_nlinear_parameters) params,
            type(fgsl_multilarge_nlinear_trs), optional trs,
            type(fgsl_multilarge_nlinear_scale), optional scale,
            type(fgsl_multilarge_nlinear_solver), optional solver,
            integer(fgsl_int), optional fdtype,
            real(c_double), optional factor_up,
            real(c_double), optional factor_down,
            real(c_double), optional avmax,
            real(c_double), optional h_df,
            real(c_double), optional h_fvv,
            integer(fgsl_size_t), optional max_iter,
            real(c_double), optional tol )
```

49.27.1.36 fgsl_multilarge_nlinear_position()

```
type(fgsl_vector) function fgsl_multilarge_nlinear_position (
            type(fgsl_multilarge_nlinear_workspace), intent(in) w )
```

49.27.1.37 fgsl_multilarge_nlinear_rcond()

```
integer(fgsl_int) function fgsl_multilarge_nlinear_rcond (
            real(fgsl_double), intent(inout) rcond,
            type(fgsl_multilarge_nlinear_workspace), intent(in) w )
```

49.27.1.38 fgsl_multilarge_nlinear_residual()

```
type(fgsl_vector) function fgsl_multilarge_nlinear_residual (
             type(fgsl_multilarge_nlinear_workspace), intent(in) w )
```

49.27.1.39 fgsl_multilarge_nlinear_setup()

```
type(fgsl_multilarge_nlinear_type) function fgsl_multilarge_nlinear_setup (
             character(kind=fgsl_char, len=*) s )
```

49.27.1.40 fgsl_multilarge_nlinear_test()

```
integer(fgsl_int) function fgsl_multilarge_nlinear_test (
             real(fgsl_double), intent(in) xtol,
             real(fgsl_double), intent(in) gtol,
             real(fgsl_double), intent(in) ftol,
             integer(fgsl_int), intent(inout) info,
             type(fgsl_multilarge_nlinear_workspace), intent(in) w )
```

49.27.1.41 fgsl_multilarge_nlinear_trs_name()

```
character(kind=fgsl_char,len=fgsl_strmax) function fgsl_multilarge_nlinear_trs_name (
             type(fgsl_multilarge_nlinear_workspace), intent(in) w )
```

49.27.1.42 fgsl_multilarge_nlinear_winit()

```
integer(fgsl_int) function fgsl_multilarge_nlinear_winit (
             type(fgsl_vector), intent(in) x,
             type(fgsl_vector), intent(in) wts,
             type(fgsl_multilarge_nlinear_fdf), intent(in) fdf,
             type(fgsl_multilarge_nlinear_workspace), intent(inout) w )
```

49.28 api/ntuple.finc File Reference

Functions/Subroutines

- type(fgsl_ntuple) function fgsl_ntuple_create (fname, data, size)
- type(fgsl_ntuple) function fgsl_ntuple_open (fname, data, size)
- integer(fgsl_int) function fgsl_ntuple_write (ntuple)
- integer(fgsl_int) function fgsl_ntuple_bookdata (ntuple)
- integer(fgsl_int) function fgsl_ntuple_read (ntuple)
- integer(fgsl_int) function fgsl_ntuple_close (ntuple)
- type(fgsl_ntuple_select_fn) function fgsl_ntuple_select_fn_init (func, params)
- type(fgsl_ntuple_value_fn) function fgsl_ntuple_value_fn_init (func, params)
- subroutine fgsl_ntuple_select_fn_free (sfunc)
- subroutine fgsl_ntuple_value_fn_free (sfunc)
- integer(fgsl_int) function fgsl_ntuple_project (h, ntuple, value_func, select_func)
- type(c_ptr) function fgsl_ntuple_data (ntuple)
- integer(fgsl_size_t) function fgsl_ntuple_size (ntuple)
- logical function fgsl_ntuple_status (ntuple)
- logical function fgsl_ntuple_value_fn_status (ntuple_value_fn)
- logical function fgsl_ntuple_select_fn_status (ntuple_select_fn)

49.28.1 Function/Subroutine Documentation

49.28.1.1 fgsl_ntuple_bookdata()

```
integer(fgsl_int) function fgsl_ntuple_bookdata (
             type(fgsl_ntuple), intent(in) ntuple )
```

49.28.1.2 fgsl_ntuple_close()

```
integer(fgsl_int) function fgsl_ntuple_close (
             type(fgsl_ntuple), intent(inout) ntuple )
```

49.28.1.3 fgsl_ntuple_create()

```
type(fgsl_ntuple) function fgsl_ntuple_create (
             character(kind=fgsl_char, len=*), intent(in) fname,
             type(c_ptr), intent(in) data,
             integer(fgsl_size_t), intent(in) size )
```

49.28.1.4 fgsl_ntuple_data()

```
type(c_ptr) function fgsl_ntuple_data (
             type(fgsl_ntuple), intent(in) ntuple )
```

49.28.1.5 fgsl_ntuple_open()

```
type(fgsl_ntuple) function fgsl_ntuple_open (
             character(kind=fgsl_char, len=*), intent(in) fname,
             type(c_ptr), intent(in) data,
             integer(fgsl_size_t), intent(in) size )
```

49.28.1.6 fgsl_ntuple_project()

```
integer(fgsl_int) function fgsl_ntuple_project (
             type(fgsl_histogram), intent(inout) h,
             type(fgsl_ntuple), intent(in) ntuple,
             type(fgsl_ntuple_value_fn), intent(in) value_func,
             type(fgsl_ntuple_select_fn), intent(in) select_func )
```

49.28.1.7 fgsl_ntuple_read()

```
integer(fgsl_int) function fgsl_ntuple_read (
             type(fgsl_ntuple), intent(inout) ntuple )
```

49.28.1.8 fgsl_ntuple_select_fn_free()

```
subroutine fgsl_ntuple_select_fn_free (
             type(fgsl_ntuple_select_fn), intent(inout) sfunc )
```

49.28.1.9 fgsl_ntuple_select_fn_init()

```
type(fgsl_ntuple_select_fn) function fgsl_ntuple_select_fn_init (
              func,
             type(c_ptr), intent(in) params )
```

49.28.1.10 fgsl_ntuple_select_fn_status()

```
logical function fgsl_ntuple_select_fn_status (
             type(fgsl_ntuple_select_fn), intent(in) ntuple_select_fn )
```

49.28.1.11 fgsl_ntuple_size()

```
integer(fgsl_size_t) function fgsl_ntuple_size (
             type(fgsl_ntuple), intent(in) ntuple )
```

49.28.1.12 fgsl_ntuple_status()

```
logical function fgsl_ntuple_status (
             type(fgsl_ntuple), intent(in) ntuple )
```

49.28.1.13 fgsl_ntuple_value_fn_free()

```
subroutine fgsl_ntuple_value_fn_free (
             type(fgsl_ntuple_value_fn), intent(inout) sfunc )
```

49.28.1.14 fgsl_ntuple_value_fn_init()

```
type(fgsl_ntuple_value_fn) function fgsl_ntuple_value_fn_init (
              func,
             type(c_ptr), intent(in) params )
```

49.28.1.15 fgsl_ntuple_value_fn_status()

```
logical function fgsl_ntuple_value_fn_status (
             type(fgsl_ntuple_value_fn), intent(in) ntuple_value_fn )
```

49.28.1.16 fgsl_ntuple_write()

```
integer(fgsl_int) function fgsl_ntuple_write (
             type(fgsl_ntuple), intent(in) ntuple )
```

49.29 api/ode.finc File Reference

Functions/Subroutines

- type(fgsl_odeiv2_system) function fgsl_odeiv2_system_init (func, dimension, params, jacobian)

  Constructor for an ODE system object.
- subroutine fgsl_odeiv2_system_free (system)
- type(fgsl_odeiv2_step) function fgsl_odeiv2_step_alloc (t, dim)
- integer(fgsl_int) function fgsl_odeiv2_step_reset (s)
- subroutine fgsl_odeiv2_step_free (s)
- character(kind=fgsl_char, len=fgsl_strmax) function fgsl_odeiv2_step_name (s)
- integer(fgsl_int) function fgsl_odeiv2_step_order (s)
- integer(c_int) function fgsl_odeiv2_step_set_driver (s, d)
- integer(fgsl_int) function fgsl_odeiv2_step_apply (s, t, h, y, yerr, dydt_in, dydt_out, dydt)
- type(fgsl_odeiv2_control) function fgsl_odeiv2_control_standard_new (eps_abs, eps_rel, a_y, a_dydt)
- type(fgsl_odeiv2_control) function fgsl_odeiv2_control_y_new (eps_abs, eps_rel)
- type(fgsl_odeiv2_control) function fgsl_odeiv2_control_yp_new (eps_abs, eps_rel)
- type(fgsl_odeiv2_control) function fgsl_odeiv2_control_scaled_new (eps_abs, eps_rel, a_y, a_dydt, scale↩ _abs)
- type(fgsl_odeiv2_control) function fgsl_odeiv2_control_alloc (t)

  Note: use of fgsl_odeiv2_control_alloc requires an initializer for the t object written in C.
- integer(fgsl_int) function fgsl_odeiv2_control_init (c, eps_abs, eps_rel, a_y, a_dydt)
- subroutine fgsl_odeiv2_control_free (c)
- logical function fgsl_odeiv2_control_status (s)
- integer(fgsl_int) function fgsl_odeiv2_control_hadjust (c, s, y, yerr, dydt, h)
- character(kind=fgsl_char, len=fgsl_strmax) function fgsl_odeiv2_control_name (c)
- integer(fgsl_int) function fgsl_odeiv2_control_errlevel (c, y, dydt, h, ind, errlev)
- integer(fgsl_int) function fgsl_odeiv2_control_set_driver (c, d)
- type(fgsl_odeiv2_evolve) function fgsl_odeiv2_evolve_alloc (dim)
- integer(fgsl_int) function fgsl_odeiv2_evolve_apply (e, con, step, dydt, t, t1, h, y)
- integer(fgsl_int) function fgsl_odeiv2_evolve_apply_fixed_step (e, con, step, dydt, t, h0, y)
- integer(c_int) function fgsl_odeiv2_evolve_reset (s)
- subroutine fgsl_odeiv2_evolve_free (s)
- logical function fgsl_odeiv2_evolve_status (s)
- logical function fgsl_odeiv2_step_status (s)
- logical function fgsl_odeiv2_system_status (s)
- integer(fgsl_int) function fgsl_odeiv2_evolve_set_driver (c, d)
- type(fgsl_odeiv2_driver) function fgsl_odeiv2_driver_alloc_y_new (sys, t, hstart, epsabs, epsrel)
- type(fgsl_odeiv2_driver) function fgsl_odeiv2_driver_alloc_yp_new (sys, t, hstart, epsabs, epsrel)
- type(fgsl_odeiv2_driver) function fgsl_odeiv2_driver_alloc_standard_new (sys, t, hstart, epsabs, epsrel, a_y, a_dydt)
- type(fgsl_odeiv2_driver) function fgsl_odeiv2_driver_alloc_scaled_new (sys, t, hstart, epsabs, epsrel, a_y, a_dydt, scale_abs)
- integer(fgsl_int) function fgsl_odeiv2_driver_set_hmin (d, hmin)
- integer(fgsl_int) function fgsl_odeiv2_driver_set_hmax (d, hmax)
- integer(fgsl_int) function fgsl_odeiv2_driver_set_nmax (d, nmax)
- integer(fgsl_int) function fgsl_odeiv2_driver_apply (d, t, t1, y)
- integer(fgsl_int) function fgsl_odeiv2_driver_apply_fixed_step (d, t, h, n, y)
- integer(fgsl_int) function fgsl_odeiv2_driver_reset (d)
- subroutine fgsl_odeiv2_driver_free (d)
- logical function fgsl_odeiv2_driver_status (s)
- integer(fgsl_int) function fgsl_odeiv2_driver_reset_hstart (d, hstart)
- type(fgsl_odeiv_system) function fgsl_odeiv_system_init (func, dimension, params, jacobian)

  Constructor for an ODE system object.

- subroutine fgsl_odeiv_system_free (system)
- type(fgsl_odeiv_step) function fgsl_odeiv_step_alloc (t, dim)
- integer(fgsl_int) function fgsl_odeiv_step_reset (s)
- subroutine fgsl_odeiv_step_free (s)
- character(kind=fgsl_char, len=fgsl_strmax) function fgsl_odeiv_step_name (s)
- integer(fgsl_int) function fgsl_odeiv_step_order (s)
- integer(fgsl_int) function fgsl_odeiv_step_apply (s, t, h, y, yerr, dydt_in, dydt_out, dydt)
- type(fgsl_odeiv_control) function fgsl_odeiv_control_standard_new (eps_abs, eps_rel, a_y, a_dydt)
- type(fgsl_odeiv_control) function fgsl_odeiv_control_y_new (eps_abs, eps_rel)
- type(fgsl_odeiv_control) function fgsl_odeiv_control_yp_new (eps_abs, eps_rel)
- type(fgsl_odeiv_control) function fgsl_odeiv_control_scaled_new (eps_abs, eps_rel, a_y, a_dydt, scale_abs)
- type(fgsl_odeiv_control) function fgsl_odeiv_control_alloc (t)

  Note: Use of fgsl_odeiv_control_alloc requires an initializer for the t object written in C.
- integer(fgsl_int) function fgsl_odeiv_control_init (c, eps_abs, eps_rel, a_y, a_dydt)
- subroutine fgsl_odeiv_control_free (c)
- integer(fgsl_int) function fgsl_odeiv_control_hadjust (c, s, y0, yerr, dydt, h)
- character(kind=fgsl_char, len=fgsl_strmax) function fgsl_odeiv_control_name (c)
- type(fgsl_odeiv_evolve) function fgsl_odeiv_evolve_alloc (dim)
- integer(fgsl_int) function fgsl_odeiv_evolve_apply (e, con, step, dydt, t, t1, h, y)
- integer(c_int) function fgsl_odeiv_evolve_reset (s)
- subroutine fgsl_odeiv_evolve_free (s)
- logical function fgsl_odeiv_evolve_status (s)
- logical function fgsl_odeiv_control_status (s)
- logical function fgsl_odeiv_step_status (s)
- logical function fgsl_odeiv_system_status (s)

49.29.1 Function/Subroutine Documentation

49.29.1.1 fgsl_odeiv2_control_alloc()

```
type(fgsl_odeiv2_control) function fgsl_odeiv2_control_alloc (
             type(fgsl_odeiv2_control_type), intent(in) t )
```

Note: use of fgsl_odeiv2_control_alloc requires an initializer for the t object written in C.

49.29.1.2 fgsl_odeiv2_control_errlevel()

```
integer(fgsl_int) function fgsl_odeiv2_control_errlevel (
             type(fgsl_odeiv2_control), value c,
             real(fgsl_double), intent(in) y,
             real(fgsl_double), intent(in) dydt,
             real(fgsl_double), intent(in) h,
             integer(fgsl_size_t), intent(in) ind,
             real(fgsl_double), intent(inout) errlev )
```

49.29.1.3 fgsl_odeiv2_control_free()

```
subroutine fgsl_odeiv2_control_free (
             type(fgsl_odeiv2_control), intent(inout) c )
```

49.29.1.4 fgsl_odeiv2_control_hadjust()

```
integer(fgsl_int) function fgsl_odeiv2_control_hadjust (
             type(fgsl_odeiv2_control), intent(in) c,
             type(fgsl_odeiv2_step), intent(in) s,
             real(fgsl_double), dimension(:), intent(in), target, contiguous y,
             real(fgsl_double), dimension(:), intent(in), target, contiguous yerr,
             real(fgsl_double), dimension(:), intent(in), target, contiguous dydt,
             real(fgsl_double), intent(out) h )
```

49.29.1.5 fgsl_odeiv2_control_init()

```
integer(fgsl_int) function fgsl_odeiv2_control_init (
             type(fgsl_odeiv2_control), intent(in) c,
             real(fgsl_double), intent(in) eps_abs,
             real(fgsl_double), intent(in) eps_rel,
             real(fgsl_double), intent(in) a_y,
             real(fgsl_double), intent(in) a_dydt )
```

49.29.1.6 fgsl_odeiv2_control_name()

```
character(kind=fgsl_char, len=fgsl_strmax) function fgsl_odeiv2_control_name (
             type(fgsl_odeiv2_control), intent(in) c )
```

49.29.1.7 fgsl_odeiv2_control_scaled_new()

```
type(fgsl_odeiv2_control) function fgsl_odeiv2_control_scaled_new (
             real(fgsl_double), intent(in) eps_abs,
             real(fgsl_double), intent(in) eps_rel,
             real(fgsl_double), intent(in) a_y,
             real(fgsl_double), intent(in) a_dydt,
             real(fgsl_double), dimension(:), intent(in), target, contiguous scale_abs )
```

49.29.1.8 fgsl_odeiv2_control_set_driver()

```
integer(fgsl_int) function fgsl_odeiv2_control_set_driver (
             type(fgsl_odeiv2_control), intent(inout) c,
             type(fgsl_odeiv2_driver), intent(in) d )
```

49.29.1.9 fgsl_odeiv2_control_standard_new()

```
type(fgsl_odeiv2_control) function fgsl_odeiv2_control_standard_new (
             real(fgsl_double), intent(in) eps_abs,
             real(fgsl_double), intent(in) eps_rel,
             real(fgsl_double), intent(in) a_y,
             real(fgsl_double), intent(in) a_dydt )
```

49.29.1.10 fgsl_odeiv2_control_status()

```
logical function fgsl_odeiv2_control_status (
             type(fgsl_odeiv2_control), intent(in) s )
```

49.29.1.11 fgsl_odeiv2_control_y_new()

```
type(fgsl_odeiv2_control) function fgsl_odeiv2_control_y_new (
             real(fgsl_double), intent(in) eps_abs,
             real(fgsl_double), intent(in) eps_rel )
```

49.29.1.12 fgsl_odeiv2_control_yp_new()

```
type(fgsl_odeiv2_control) function fgsl_odeiv2_control_yp_new (
             real(fgsl_double), intent(in) eps_abs,
             real(fgsl_double), intent(in) eps_rel )
```

49.29.1.13 fgsl_odeiv2_driver_alloc_scaled_new()

```
type(fgsl_odeiv2_driver) function fgsl_odeiv2_driver_alloc_scaled_new (
             type(fgsl_odeiv2_system), intent(in) sys,
             type(fgsl_odeiv2_step_type), intent(in) t,
             real(c_double), intent(in) hstart,
             real(c_double), intent(in) epsabs,
             real(c_double), intent(in) epsrel,
             real(c_double), intent(in) a_y,
             real(c_double), intent(in) a_dydt,
             real(c_double), dimension(:)  scale_abs )
```

49.29.1.14 fgsl_odeiv2_driver_alloc_standard_new()

```
type(fgsl_odeiv2_driver) function fgsl_odeiv2_driver_alloc_standard_new (
             type(fgsl_odeiv2_system), intent(in) sys,
             type(fgsl_odeiv2_step_type), intent(in) t,
             real(c_double), intent(in) hstart,
             real(c_double), intent(in) epsabs,
             real(c_double), intent(in) epsrel,
             real(c_double), intent(in) a_y,
             real(c_double), intent(in) a_dydt )
```

49.29.1.15 fgsl_odeiv2_driver_alloc_y_new()

```
type(fgsl_odeiv2_driver) function fgsl_odeiv2_driver_alloc_y_new (
             type(fgsl_odeiv2_system), intent(in) sys,
             type(fgsl_odeiv2_step_type), intent(in) t,
             real(c_double), intent(in) hstart,
             real(c_double), intent(in) epsabs,
             real(c_double), intent(in) epsrel )
```

49.29.1.16 fgsl_odeiv2_driver_alloc_yp_new()

```
type(fgsl_odeiv2_driver) function fgsl_odeiv2_driver_alloc_yp_new (
             type(fgsl_odeiv2_system), intent(in) sys,
             type(fgsl_odeiv2_step_type), intent(in) t,
             real(c_double), intent(in) hstart,
             real(c_double), intent(in) epsabs,
             real(c_double), intent(in) epsrel )
```

49.29.1.17 fgsl_odeiv2_driver_apply()

```
integer(fgsl_int) function fgsl_odeiv2_driver_apply (
             type(fgsl_odeiv2_driver), intent(inout) d,
             real(fgsl_double), intent(inout) t,
             real(fgsl_double), intent(in) t1,
             real(fgsl_double), dimension(:), intent(inout) y )
```

49.29.1.18 fgsl_odeiv2_driver_apply_fixed_step()

```
integer(fgsl_int) function fgsl_odeiv2_driver_apply_fixed_step (
             type(fgsl_odeiv2_driver), intent(inout) d,
             real(fgsl_double), intent(inout) t,
             real(fgsl_double), intent(in) h,
             integer(fgsl_long), intent(in) n,
             real(fgsl_double), dimension(:), intent(inout) y )
```

49.29.1.19 fgsl_odeiv2_driver_free()

```
subroutine fgsl_odeiv2_driver_free (
             type(fgsl_odeiv2_driver), intent(inout) d )
```

49.29.1.20 fgsl_odeiv2_driver_reset()

```
integer(fgsl_int) function fgsl_odeiv2_driver_reset (
             type(fgsl_odeiv2_driver), intent(inout) d )
```

49.29.1.21 fgsl_odeiv2_driver_reset_hstart()

```
integer(fgsl_int) function fgsl_odeiv2_driver_reset_hstart (
             type(fgsl_odeiv2_driver), intent(inout) d,
             real(fgsl_double), intent(in) hstart )
```

49.29.1.22 fgsl_odeiv2_driver_set_hmax()

```
integer(fgsl_int) function fgsl_odeiv2_driver_set_hmax (
             type(fgsl_odeiv2_driver), intent(inout) d,
             real(fgsl_double) hmax )
```

49.29.1.23 fgsl_odeiv2_driver_set_hmin()

```
integer(fgsl_int) function fgsl_odeiv2_driver_set_hmin (
             type(fgsl_odeiv2_driver), intent(inout) d,
             real(fgsl_double) hmin )
```

49.29.1.24 fgsl_odeiv2_driver_set_nmax()

```
integer(fgsl_int) function fgsl_odeiv2_driver_set_nmax (
             type(fgsl_odeiv2_driver), intent(inout) d,
             integer(fgsl_long) nmax )
```

49.29.1.25 fgsl_odeiv2_driver_status()

```
logical function fgsl_odeiv2_driver_status (
             type(fgsl_odeiv2_driver), intent(in) s )
```

49.29.1.26 fgsl_odeiv2_evolve_alloc()

```
type(fgsl_odeiv2_evolve) function fgsl_odeiv2_evolve_alloc (
             integer(fgsl_size_t), intent(in) dim )
```

49.29.1.27 fgsl_odeiv2_evolve_apply()

```
integer(fgsl_int) function fgsl_odeiv2_evolve_apply (
             type(fgsl_odeiv2_evolve), intent(inout) e,
             type(fgsl_odeiv2_control), intent(inout) con,
             type(fgsl_odeiv2_step), intent(inout) step,
             type(fgsl_odeiv2_system), intent(in) dydt,
             real(fgsl_double), intent(inout) t,
             real(fgsl_double), intent(in) t1,
             real(fgsl_double), intent(inout) h,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous y )
```

49.29.1.28 fgsl_odeiv2_evolve_apply_fixed_step()

```
integer(fgsl_int) function fgsl_odeiv2_evolve_apply_fixed_step (
             type(fgsl_odeiv2_evolve), intent(inout) e,
             type(fgsl_odeiv2_control), intent(inout) con,
             type(fgsl_odeiv2_step), intent(inout) step,
             type(fgsl_odeiv2_system), intent(in) dydt,
             real(fgsl_double), intent(inout) t,
             real(fgsl_double), intent(in) h0,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous y )
```

49.29.1.29 fgsl_odeiv2_evolve_free()

```
subroutine fgsl_odeiv2_evolve_free (
             type(fgsl_odeiv2_evolve), intent(inout) s )
```

49.29.1.30 fgsl_odeiv2_evolve_reset()

```
integer(c_int) function fgsl_odeiv2_evolve_reset (
            type(fgsl_odeiv2_evolve), intent(inout) s )
```

49.29.1.31 fgsl_odeiv2_evolve_set_driver()

```
integer(fgsl_int) function fgsl_odeiv2_evolve_set_driver (
            type(fgsl_odeiv2_evolve), intent(inout) c,
            type(fgsl_odeiv2_driver), intent(in) d )
```

49.29.1.32 fgsl_odeiv2_evolve_status()

```
logical function fgsl_odeiv2_evolve_status (
            type(fgsl_odeiv2_evolve), intent(in) s )
```

49.29.1.33 fgsl_odeiv2_step_alloc()

```
type(fgsl_odeiv2_step) function fgsl_odeiv2_step_alloc (
            type(fgsl_odeiv2_step_type), intent(in) t,
            integer(fgsl_size_t), intent(in) dim )
```

49.29.1.34 fgsl_odeiv2_step_apply()

```
integer(fgsl_int) function fgsl_odeiv2_step_apply (
            type(fgsl_odeiv2_step), intent(in) s,
            real(fgsl_double), intent(in) t,
            real(fgsl_double), intent(in) h,
            real(fgsl_double), dimension(:), intent(inout), target, contiguous y,
            real(fgsl_double), dimension(:), intent(inout), target, contiguous yerr,
            real(fgsl_double), dimension(:), intent(in), target, contiguous dydt_in,
            real(fgsl_double), dimension(:), intent(inout), target, contiguous dydt_out,
            type(fgsl_odeiv2_system), intent(in) dydt )
```

49.29.1.35 fgsl_odeiv2_step_free()

```
subroutine fgsl_odeiv2_step_free (
            type(fgsl_odeiv2_step), intent(inout) s )
```

49.29.1.36 fgsl_odeiv2_step_name()

```
character(kind=fgsl_char, len=fgsl_strmax) function fgsl_odeiv2_step_name (
             type(fgsl_odeiv2_step), intent(in) s )
```

49.29.1.37 fgsl_odeiv2_step_order()

```
integer(fgsl_int) function fgsl_odeiv2_step_order (
             type(fgsl_odeiv2_step), intent(in) s )
```

49.29.1.38 fgsl_odeiv2_step_reset()

```
integer(fgsl_int) function fgsl_odeiv2_step_reset (
             type(fgsl_odeiv2_step), intent(inout) s )
```

49.29.1.39 fgsl_odeiv2_step_set_driver()

```
integer(c_int) function fgsl_odeiv2_step_set_driver (
             type(fgsl_odeiv2_step) s,
             type(fgsl_odeiv2_driver), intent(in) d )
```

49.29.1.40 fgsl_odeiv2_step_status()

```
logical function fgsl_odeiv2_step_status (
             type(fgsl_odeiv2_step), intent(in) s )
```

49.29.1.41 fgsl_odeiv2_system_free()

```
subroutine fgsl_odeiv2_system_free (
             type(fgsl_odeiv2_system), intent(inout) system )
```

49.29.1.42 fgsl_odeiv2_system_init()

```
type(fgsl_odeiv2_system) function fgsl_odeiv2_system_init (
              func,
             integer(fgsl_size_t) dimension,
             type(c_ptr), intent(in), optional params,
             optional jacobian )
```

Constructor for an ODE system object.

Parameters

func	- interface for a double precision vector valued function with derivatives and a parameter of arbitrary type
dimension	- number of components of the vector function
params	- parameter of arbitrary type
jacobian	- interface for the jacobian of func

Returns

ODE system object.

49.29.1.43 fgsl_odeiv2_system_status()

```
logical function fgsl_odeiv2_system_status (
            type(fgsl_odeiv2_system), intent(in) s )
```

49.29.1.44 fgsl_odeiv_control_alloc()

```
type(fgsl_odeiv_control) function fgsl_odeiv_control_alloc (
            type(fgsl_odeiv_control_type), intent(in) t )
```

Note: Use of fgsl_odeiv_control_alloc requires an initializer for the t object written in C.

49.29.1.45 fgsl_odeiv_control_free()

```
subroutine fgsl_odeiv_control_free (
            type(fgsl_odeiv_control), intent(inout) c )
```

49.29.1.46 fgsl_odeiv_control_hadjust()

```
integer(fgsl_int) function fgsl_odeiv_control_hadjust (
            type(fgsl_odeiv_control), intent(in) c,
            type(fgsl_odeiv_step), intent(in) s,
            real(fgsl_double), dimension(:), intent(in), target, contiguous y0,
            real(fgsl_double), dimension(:), intent(in), target, contiguous yerr,
            real(fgsl_double), dimension(:), intent(in), target, contiguous dydt,
            real(fgsl_double), dimension(:), intent(inout), target, contiguous h )
```

49.29.1.47 fgsl_odeiv_control_init()

```
integer(fgsl_int) function fgsl_odeiv_control_init (
            type(fgsl_odeiv_control), intent(in) c,
            real(fgsl_double), intent(in) eps_abs,
            real(fgsl_double), intent(in) eps_rel,
            real(fgsl_double), intent(in) a_y,
            real(fgsl_double), intent(in) a_dydt )
```

49.29.1.48 fgsl_odeiv_control_name()

```
character(kind=fgsl_char, len=fgsl_strmax) function fgsl_odeiv_control_name (
            type(fgsl_odeiv_control), intent(in) c )
```

49.29.1.49 fgsl_odeiv_control_scaled_new()

```
type(fgsl_odeiv_control) function fgsl_odeiv_control_scaled_new (
            real(fgsl_double), intent(in) eps_abs,
            real(fgsl_double), intent(in) eps_rel,
            real(fgsl_double), intent(in) a_y,
            real(fgsl_double), intent(in) a_dydt,
            real(fgsl_double), dimension(:), intent(in), target, contiguous scale_abs )
```

49.29.1.50 fgsl_odeiv_control_standard_new()

```
type(fgsl_odeiv_control) function fgsl_odeiv_control_standard_new (
            real(fgsl_double), intent(in) eps_abs,
            real(fgsl_double), intent(in) eps_rel,
            real(fgsl_double), intent(in) a_y,
            real(fgsl_double), intent(in) a_dydt )
```

49.29.1.51 fgsl_odeiv_control_status()

```
logical function fgsl_odeiv_control_status (
            type(fgsl_odeiv_control), intent(in) s )
```

49.29.1.52 fgsl_odeiv_control_y_new()

```
type(fgsl_odeiv_control) function fgsl_odeiv_control_y_new (
             real(fgsl_double), intent(in) eps_abs,
             real(fgsl_double), intent(in) eps_rel )
```

49.29.1.53 fgsl_odeiv_control_yp_new()

```
type(fgsl_odeiv_control) function fgsl_odeiv_control_yp_new (
             real(fgsl_double), intent(in) eps_abs,
             real(fgsl_double), intent(in) eps_rel )
```

49.29.1.54 fgsl_odeiv_evolve_alloc()

```
type(fgsl_odeiv_evolve) function fgsl_odeiv_evolve_alloc (
             integer(fgsl_size_t), intent(in) dim )
```

49.29.1.55 fgsl_odeiv_evolve_apply()

```
integer(fgsl_int) function fgsl_odeiv_evolve_apply (
             type(fgsl_odeiv_evolve), intent(inout) e,
             type(fgsl_odeiv_control), intent(inout) con,
             type(fgsl_odeiv_step), intent(inout) step,
             type(fgsl_odeiv_system), intent(in) dydt,
             real(fgsl_double), intent(inout) t,
             real(fgsl_double), intent(in) t1,
             real(fgsl_double), intent(inout) h,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous y )
```

49.29.1.56 fgsl_odeiv_evolve_free()

```
subroutine fgsl_odeiv_evolve_free (
             type(fgsl_odeiv_evolve), intent(inout) s )
```

49.29.1.57 fgsl_odeiv_evolve_reset()

```
integer(c_int) function fgsl_odeiv_evolve_reset (
             type(fgsl_odeiv_evolve), intent(inout) s )
```

49.29.1.58 fgsl_odeiv_evolve_status()

```
logical function fgsl_odeiv_evolve_status (
            type(fgsl_odeiv_evolve), intent(in) s )
```

49.29.1.59 fgsl_odeiv_step_alloc()

```
type(fgsl_odeiv_step) function fgsl_odeiv_step_alloc (
            type(fgsl_odeiv_step_type), intent(in) t,
            integer(fgsl_size_t), intent(in) dim )
```

49.29.1.60 fgsl_odeiv_step_apply()

```
integer(fgsl_int) function fgsl_odeiv_step_apply (
            type(fgsl_odeiv_step), intent(in) s,
            real(fgsl_double), intent(in) t,
            real(fgsl_double), intent(in) h,
            real(fgsl_double), dimension(:), intent(inout), target, contiguous y,
            real(fgsl_double), dimension(:), intent(inout), target, contiguous yerr,
            real(fgsl_double), dimension(:), intent(inout), target, contiguous dydt_in,
            real(fgsl_double), dimension(:), intent(inout), target, contiguous dydt_out,
            type(fgsl_odeiv_system), intent(in) dydt )
```

49.29.1.61 fgsl_odeiv_step_free()

```
subroutine fgsl_odeiv_step_free (
            type(fgsl_odeiv_step), intent(inout) s )
```

49.29.1.62 fgsl_odeiv_step_name()

```
character(kind=fgsl_char, len=fgsl_strmax) function fgsl_odeiv_step_name (
            type(fgsl_odeiv_step), intent(in) s )
```

49.29.1.63 fgsl_odeiv_step_order()

```
integer(fgsl_int) function fgsl_odeiv_step_order (
            type(fgsl_odeiv_step), intent(in) s )
```

49.29.1.64 fgsl_odeiv_step_reset()

```
integer(fgsl_int) function fgsl_odeiv_step_reset (
             type(fgsl_odeiv_step), intent(inout) s )
```

49.29.1.65 fgsl_odeiv_step_status()

```
logical function fgsl_odeiv_step_status (
             type(fgsl_odeiv_step), intent(in) s )
```

49.29.1.66 fgsl_odeiv_system_free()

```
subroutine fgsl_odeiv_system_free (
             type(fgsl_odeiv_system), intent(inout) system )
```

49.29.1.67 fgsl_odeiv_system_init()

```
type(fgsl_odeiv_system) function fgsl_odeiv_system_init (
              func,
             integer(fgsl_size_t) dimension,
             type(c_ptr), intent(in), optional params,
             optional jacobian )
```

Constructor for an ODE system object.

Parameters

func	- interface for a double precision vector valued function with derivatives and a parameter of arbitrary type
dimension	- number of components of the vector function
params	- parameter of arbitrary type
jacobian	- interface for the jacobian of func

Returns

ODE system object.

49.29.1.68 fgsl_odeiv_system_status()

```
logical function fgsl_odeiv_system_status (
             type(fgsl_odeiv_system), intent(in) s )
```

49.30 api/permutation.finc File Reference

Functions/Subroutines

- type(fgsl_permutation) function fgsl_permutation_alloc (n)
- type(fgsl_permutation) function fgsl_permutation_calloc (n)
- subroutine fgsl_permutation_init (p)
- subroutine fgsl_permutation_free (p)
- integer(fgsl_int) function fgsl_permutation_memcpy (dest, src)
- integer(fgsl_size_t) function fgsl_permutation_get (p, i)
- integer(fgsl_int) function fgsl_permutation_swap (p, i, j)
- integer(fgsl_size_t) function fgsl_permutation_size (p)
- integer(fgsl_size_t) function, dimension(:), pointer fgsl_permutation_data (p)
- integer(fgsl_int) function fgsl_permutation_valid (p)
- subroutine fgsl_permutation_reverse (p)
- integer(fgsl_int) function fgsl_permutation_inverse (inv, p)
- integer(fgsl_int) function fgsl_permutation_next (p)
- integer(fgsl_int) function fgsl_permutation_prev (p)
- integer(fgsl_int) function fgsl_permute (p, data, stride, n)
- integer(fgsl_int) function fgsl_permute_long (p, data, stride, n)
- integer(fgsl_int) function fgsl_permute_inverse (p, data, stride, n)
- integer(fgsl_int) function fgsl_permute_long_inverse (p, data, stride, n)
- integer(fgsl_int) function fgsl_permute_vector (p, v)
- integer(fgsl_int) function fgsl_permute_vector_inverse (p, v)
- integer(fgsl_int) function fgsl_permute_matrix (p, a)
- integer(fgsl_int) function fgsl_permutation_mul (p, pa, pb)
- integer(fgsl_int) function fgsl_permutation_fwrite (stream, p)
- integer(fgsl_int) function fgsl_permutation_fread (stream, p)
- integer(fgsl_int) function fgsl_permutation_fprintf (stream, p, format)
- integer(fgsl_int) function fgsl_permutation_fscanf (stream, p)
- integer(fgsl_int) function fgsl_permutation_linear_to_canonical (q, p)
- integer(fgsl_int) function fgsl_permutation_canonical_to_linear (p, q)
- integer(fgsl_size_t) function fgsl_permutation_inversions (p)
- integer(fgsl_size_t) function fgsl_permutation_linear_cycles (p)
- integer(fgsl_size_t) function fgsl_permutation_canonical_cycles (p)
- type(fgsl_combination) function fgsl_combination_alloc (n, k)
- type(fgsl_combination) function fgsl_combination_calloc (n, k)
- subroutine fgsl_combination_init_first (c)
- subroutine fgsl_combination_init_last (c)
- subroutine fgsl_combination_free (c)
- integer(fgsl_int) function fgsl_combination_memcpy (dest, src)
- integer(fgsl_size_t) function fgsl_combination_get (c, i)
- integer(fgsl_size_t) function fgsl_combination_n (c)
- integer(fgsl_size_t) function fgsl_combination_k (c)
- integer(fgsl_size_t) function, dimension(:), pointer fgsl_combination_data (c)
- integer(fgsl_int) function fgsl_combination_valid (c)
- integer(fgsl_int) function fgsl_combination_next (c)
- integer(fgsl_int) function fgsl_combination_prev (c)
- integer(fgsl_int) function fgsl_combination_fwrite (stream, c)
- integer(fgsl_int) function fgsl_combination_fread (stream, c)
- integer(fgsl_int) function fgsl_combination_fprintf (stream, c, format)
- integer(fgsl_int) function fgsl_combination_fscanf (stream, c)
- type(fgsl_multiset) function fgsl_multiset_alloc (n, k)
- type(fgsl_multiset) function fgsl_multiset_calloc (n, k)

- subroutine fgsl_multiset_init_first (c)
- subroutine fgsl_multiset_init_last (c)
- subroutine fgsl_multiset_free (c)
- integer(fgsl_int) function fgsl_multiset_memcpy (dest, src)
- integer(fgsl_size_t) function fgsl_multiset_get (c, i)
- integer(fgsl_size_t) function fgsl_multiset_n (c)
- integer(fgsl_size_t) function fgsl_multiset_k (c)
- integer(fgsl_size_t) function, dimension(:), pointer fgsl_multiset_data (c)
- integer(fgsl_int) function fgsl_multiset_valid (c)
- integer(fgsl_int) function fgsl_multiset_next (c)
- integer(fgsl_int) function fgsl_multiset_prev (c)
- integer(fgsl_int) function fgsl_multiset_fwrite (stream, c)
- integer(fgsl_int) function fgsl_multiset_fread (stream, c)
- integer(fgsl_int) function fgsl_multiset_fprintf (stream, c, format)
- integer(fgsl_int) function fgsl_multiset_fscanf (stream, c)
- logical function fgsl_permutation_status (permutation)
- logical function fgsl_combination_status (combination)
- logical function fgsl_multiset_status (multiset)
- integer(fgsl_size_t) function fgsl_sizeof_permutation (p)
- integer(fgsl_size_t) function fgsl_sizeof_combination (c)
- integer(fgsl_size_t) function fgsl_sizeof_multiset (c)

49.30.1 Function/Subroutine Documentation

49.30.1.1 fgsl_combination_alloc()

```
type(fgsl_combination) function fgsl_combination_alloc (
             integer(fgsl_size_t), intent(in) n,
             integer(fgsl_size_t), intent(in) k )
```

49.30.1.2 fgsl_combination_calloc()

```
type(fgsl_combination) function fgsl_combination_calloc (
             integer(fgsl_size_t), intent(in) n,
             integer(fgsl_size_t), intent(in) k )
```

49.30.1.3 fgsl_combination_data()

```
integer(fgsl_size_t) function, dimension(:), pointer fgsl_combination_data (
             type(fgsl_combination), intent(in) c )
```

49.30.1.4 fgsl_combination_fprintf()

```
integer(fgsl_int) function fgsl_combination_fprintf (
             type(fgsl_file), intent(in) stream,
             type(fgsl_combination), intent(in) c,
             character(kind=fgsl_char, len=*), intent(in) format )
```

49.30.1.5 fgsl_combination_fread()

```
integer(fgsl_int) function fgsl_combination_fread (
             type(fgsl_file), intent(in) stream,
             type(fgsl_combination), intent(inout) c )
```

49.30.1.6 fgsl_combination_free()

```
subroutine fgsl_combination_free (
             type(fgsl_combination), intent(inout) c )
```

49.30.1.7 fgsl_combination_fscanf()

```
integer(fgsl_int) function fgsl_combination_fscanf (
             type(fgsl_file), intent(in) stream,
             type(fgsl_combination), intent(inout) c )
```

49.30.1.8 fgsl_combination_fwrite()

```
integer(fgsl_int) function fgsl_combination_fwrite (
             type(fgsl_file), intent(in) stream,
             type(fgsl_combination), intent(in) c )
```

49.30.1.9 fgsl_combination_get()

```
integer(fgsl_size_t) function fgsl_combination_get (
             type(fgsl_combination), intent(inout) c,
             integer(fgsl_size_t), intent(in) i )
```

49.30.1.10 fgsl_combination_init_first()

```
subroutine fgsl_combination_init_first (
             type(fgsl_combination), intent(inout) c )
```

49.30.1.11 fgsl_combination_init_last()

```
subroutine fgsl_combination_init_last (
             type(fgsl_combination), intent(inout) c )
```

49.30.1.12 fgsl_combination_k()

```
integer(fgsl_size_t) function fgsl_combination_k (
             type(fgsl_combination), intent(in) c )
```

49.30.1.13 fgsl_combination_memcpy()

```
integer(fgsl_int) function fgsl_combination_memcpy (
             type(fgsl_combination), intent(inout) dest,
             type(fgsl_combination), intent(in) src )
```

49.30.1.14 fgsl_combination_n()

```
integer(fgsl_size_t) function fgsl_combination_n (
             type(fgsl_combination), intent(in) c )
```

49.30.1.15 fgsl_combination_next()

```
integer(fgsl_int) function fgsl_combination_next (
             type(fgsl_combination), intent(in) c )
```

49.30.1.16 fgsl_combination_prev()

```
integer(fgsl_int) function fgsl_combination_prev (
             type(fgsl_combination), intent(in) c )
```

49.30.1.17 fgsl_combination_status()

```
logical function fgsl_combination_status (
             type(fgsl_combination), intent(in) combination )
```

49.30.1.18 fgsl_combination_valid()

```
integer(fgsl_int) function fgsl_combination_valid (
             type(fgsl_combination), intent(in) c )
```

49.30.1.19 fgsl_multiset_alloc()

```
type(fgsl_multiset) function fgsl_multiset_alloc (
             integer(fgsl_size_t), intent(in) n,
             integer(fgsl_size_t), intent(in) k )
```

49.30.1.20 fgsl_multiset_calloc()

```
type(fgsl_multiset) function fgsl_multiset_calloc (
             integer(fgsl_size_t), intent(in) n,
             integer(fgsl_size_t), intent(in) k )
```

49.30.1.21 fgsl_multiset_data()

```
integer(fgsl_size_t) function, dimension(:), pointer fgsl_multiset_data (
             type(fgsl_multiset), intent(in) c )
```

49.30.1.22 fgsl_multiset_fprintf()

```
integer(fgsl_int) function fgsl_multiset_fprintf (
             type(fgsl_file), intent(in) stream,
             type(fgsl_multiset), intent(in) c,
             character(kind=fgsl_char, len=*), intent(in) format )
```

49.30.1.23 fgsl_multiset_fread()

```
integer(fgsl_int) function fgsl_multiset_fread (
             type(fgsl_file), intent(in) stream,
             type(fgsl_multiset), intent(inout) c )
```

49.30.1.24 fgsl_multiset_free()

```
subroutine fgsl_multiset_free (
             type(fgsl_multiset), intent(inout) c )
```

49.30.1.25 fgsl_multiset_fscanf()

```
integer(fgsl_int) function fgsl_multiset_fscanf (
             type(fgsl_file), intent(in) stream,
             type(fgsl_multiset), intent(inout) c )
```

49.30.1.26 fgsl_multiset_fwrite()

```
integer(fgsl_int) function fgsl_multiset_fwrite (
             type(fgsl_file), intent(in) stream,
             type(fgsl_multiset), intent(in) c )
```

49.30.1.27 fgsl_multiset_get()

```
integer(fgsl_size_t) function fgsl_multiset_get (
             type(fgsl_multiset), intent(inout) c,
             integer(fgsl_size_t), intent(in) i )
```

49.30.1.28 fgsl_multiset_init_first()

```
subroutine fgsl_multiset_init_first (
             type(fgsl_multiset), intent(inout) c )
```

49.30.1.29 fgsl_multiset_init_last()

```
subroutine fgsl_multiset_init_last (
             type(fgsl_multiset), intent(inout) c )
```

49.30.1.30 fgsl_multiset_k()

```
integer(fgsl_size_t) function fgsl_multiset_k (
             type(fgsl_multiset), intent(in) c )
```

49.30.1.31 fgsl_multiset_memcpy()

```
integer(fgsl_int) function fgsl_multiset_memcpy (
             type(fgsl_multiset), intent(inout) dest,
             type(fgsl_multiset), intent(in) src )
```

49.30.1.32 fgsl_multiset_n()

```
integer(fgsl_size_t) function fgsl_multiset_n (
             type(fgsl_multiset), intent(in) c )
```

49.30.1.33 fgsl_multiset_next()

```
integer(fgsl_int) function fgsl_multiset_next (
             type(fgsl_multiset), intent(in) c )
```

49.30.1.34 fgsl_multiset_prev()

```
integer(fgsl_int) function fgsl_multiset_prev (
             type(fgsl_multiset), intent(in) c )
```

49.30.1.35 fgsl_multiset_status()

```
logical function fgsl_multiset_status (
             type(fgsl_multiset), intent(in) multiset )
```

49.30.1.36 fgsl_multiset_valid()

```
integer(fgsl_int) function fgsl_multiset_valid (
            type(fgsl_multiset), intent(in) c )
```

49.30.1.37 fgsl_permutation_alloc()

```
type(fgsl_permutation) function fgsl_permutation_alloc (
            integer(fgsl_size_t), intent(in) n )
```

49.30.1.38 fgsl_permutation_calloc()

```
type(fgsl_permutation) function fgsl_permutation_calloc (
            integer(fgsl_size_t), intent(in) n )
```

49.30.1.39 fgsl_permutation_canonical_cycles()

```
integer(fgsl_size_t) function fgsl_permutation_canonical_cycles (
            type(fgsl_permutation), intent(in) p )
```

49.30.1.40 fgsl_permutation_canonical_to_linear()

```
integer(fgsl_int) function fgsl_permutation_canonical_to_linear (
            type(fgsl_permutation), intent(inout) p,
            type(fgsl_permutation), intent(in) q )
```

49.30.1.41 fgsl_permutation_data()

```
integer(fgsl_size_t) function, dimension(:), pointer fgsl_permutation_data (
            type(fgsl_permutation), intent(in) p )
```

49.30.1.42 fgsl_permutation_fprintf()

```
integer(fgsl_int) function fgsl_permutation_fprintf (
            type(fgsl_file), intent(in) stream,
            type(fgsl_permutation), intent(in) p,
            character(kind=fgsl_char, len=*), intent(in) format )
```

49.30.1.43 fgsl_permutation_fread()

```
integer(fgsl_int) function fgsl_permutation_fread (
             type(fgsl_file), intent(in) stream,
             type(fgsl_permutation), intent(inout) p )
```

49.30.1.44 fgsl_permutation_free()

```
subroutine fgsl_permutation_free (
             type(fgsl_permutation), intent(inout) p )
```

49.30.1.45 fgsl_permutation_fscanf()

```
integer(fgsl_int) function fgsl_permutation_fscanf (
             type(fgsl_file), intent(in) stream,
             type(fgsl_permutation), intent(inout) p )
```

49.30.1.46 fgsl_permutation_fwrite()

```
integer(fgsl_int) function fgsl_permutation_fwrite (
             type(fgsl_file), intent(in) stream,
             type(fgsl_permutation), intent(in) p )
```

49.30.1.47 fgsl_permutation_get()

```
integer(fgsl_size_t) function fgsl_permutation_get (
             type(fgsl_permutation), intent(inout) p,
             integer(fgsl_size_t), intent(in) i )
```

49.30.1.48 fgsl_permutation_init()

```
subroutine fgsl_permutation_init (
             type(fgsl_permutation), intent(inout) p )
```

49.30.1.49 fgsl_permutation_inverse()

```
integer(fgsl_int) function fgsl_permutation_inverse (
             type(fgsl_permutation), intent(inout) inv,
             type(fgsl_permutation), intent(in) p )
```

49.30.1.50 fgsl_permutation_inversions()

```
integer(fgsl_size_t) function fgsl_permutation_inversions (
             type(fgsl_permutation), intent(in) p )
```

49.30.1.51 fgsl_permutation_linear_cycles()

```
integer(fgsl_size_t) function fgsl_permutation_linear_cycles (
             type(fgsl_permutation), intent(in) p )
```

49.30.1.52 fgsl_permutation_linear_to_canonical()

```
integer(fgsl_int) function fgsl_permutation_linear_to_canonical (
             type(fgsl_permutation), intent(inout) q,
             type(fgsl_permutation), intent(in) p )
```

49.30.1.53 fgsl_permutation_memcpy()

```
integer(fgsl_int) function fgsl_permutation_memcpy (
             type(fgsl_permutation), intent(inout) dest,
             type(fgsl_permutation), intent(in) src )
```

49.30.1.54 fgsl_permutation_mul()

```
integer(fgsl_int) function fgsl_permutation_mul (
             type(fgsl_permutation), intent(inout) p,
             type(fgsl_permutation), intent(in) pa,
             type(fgsl_permutation), intent(in) pb )
```

49.30.1.55 fgsl_permutation_next()

```
integer(fgsl_int) function fgsl_permutation_next (
            type(fgsl_permutation), intent(in) p )
```

49.30.1.56 fgsl_permutation_prev()

```
integer(fgsl_int) function fgsl_permutation_prev (
            type(fgsl_permutation), intent(in) p )
```

49.30.1.57 fgsl_permutation_reverse()

```
subroutine fgsl_permutation_reverse (
            type(fgsl_permutation), intent(inout) p )
```

49.30.1.58 fgsl_permutation_size()

```
integer(fgsl_size_t) function fgsl_permutation_size (
            type(fgsl_permutation), intent(in) p )
```

49.30.1.59 fgsl_permutation_status()

```
logical function fgsl_permutation_status (
            type(fgsl_permutation), intent(in) permutation )
```

49.30.1.60 fgsl_permutation_swap()

```
integer(fgsl_int) function fgsl_permutation_swap (
            type(fgsl_permutation), intent(inout) p,
            integer(fgsl_size_t), intent(in) i,
            integer(fgsl_size_t), intent(in) j )
```

49.30.1.61 fgsl_permutation_valid()

```
integer(fgsl_int) function fgsl_permutation_valid (
            type(fgsl_permutation), intent(in) p )
```

49.30.1.62 fgsl_permute()

```
integer(fgsl_int) function fgsl_permute (
             integer(fgsl_size_t), dimension(:), intent(in), target, contiguous p,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.30.1.63 fgsl_permute_inverse()

```
integer(fgsl_int) function fgsl_permute_inverse (
             integer(fgsl_size_t), dimension(:), intent(in), target, contiguous p,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.30.1.64 fgsl_permute_long()

```
integer(fgsl_int) function fgsl_permute_long (
             integer(fgsl_size_t), dimension(:), intent(in), target, contiguous p,
             integer(fgsl_long), dimension(:), intent(inout), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.30.1.65 fgsl_permute_long_inverse()

```
integer(fgsl_int) function fgsl_permute_long_inverse (
             integer(fgsl_size_t), dimension(:), intent(in), target, contiguous p,
             integer(fgsl_long), dimension(:), intent(inout), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.30.1.66 fgsl_permute_matrix()

```
integer(fgsl_int) function fgsl_permute_matrix (
             type(fgsl_permutation), intent(in) p,
             type(fgsl_matrix), intent(inout) a )
```

49.30.1.67 fgsl_permute_vector()

```
integer(fgsl_int) function fgsl_permute_vector (
             type(fgsl_permutation), intent(in) p,
             type(fgsl_vector), intent(inout) v )
```

49.30.1.68 fgsl_permute_vector_inverse()

```
integer(fgsl_int) function fgsl_permute_vector_inverse (
             type(fgsl_permutation), intent(in) p,
             type(fgsl_vector), intent(inout) v )
```

49.30.1.69 fgsl_sizeof_combination()

```
integer(fgsl_size_t) function fgsl_sizeof_combination (
             type(fgsl_combination), intent(in) c )
```

49.30.1.70 fgsl_sizeof_multiset()

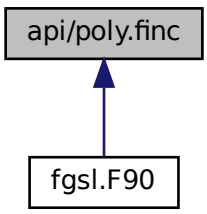
```
integer(fgsl_size_t) function fgsl_sizeof_multiset (
             type(fgsl_multiset), intent(in) c )
```

49.30.1.71 fgsl_sizeof_permutation()

```
integer(fgsl_size_t) function fgsl_sizeof_permutation (
             type(fgsl_permutation), intent(in) p )
```

49.31 api/poly.finc File Reference

This graph shows which files directly or indirectly include this file:



Functions/Subroutines

- real(fgsl_double) function fgsl_poly_eval (c, x)
- complex(fgsl_double_complex) function fgsl_poly_complex_eval (c, z)
- complex(fgsl_double_complex) function fgsl_complex_poly_complex_eval (c, z)
- integer(fgsl_int) function fgsl_poly_eval_derivs (c, x, res)
- integer(fgsl_int) function fgsl_poly_dd_init (dd, x, y)
- real(fgsl_double) function fgsl_poly_dd_eval (dd, xa, x)
- integer(fgsl_int) function fgsl_poly_dd_taylor (c, xp, dd, x, w)
- integer(fgsl_int) function fgsl_poly_dd_hermite_init (dd, z, xa, ya, dya)
- integer(fgsl_int) function fgsl_poly_solve_quadratic (a, b, c, x0, x1)
- integer(fgsl_int) function fgsl_poly_complex_solve_quadratic (a, b, c, x0, x1)
- integer(fgsl_int) function fgsl_poly_solve_cubic (a, b, c, x0, x1, x2)
- integer(fgsl_int) function fgsl_poly_complex_solve_cubic (a, b, c, x0, x1, x2)
- type(fgsl_poly_complex_workspace) function fgsl_poly_complex_workspace_alloc (n)
- subroutine fgsl_poly_complex_workspace_free (w)
- logical function fgsl_poly_complex_workspace_stat (w)
- integer(fgsl_int) function fgsl_poly_complex_solve (a, n, w, z)

49.31.1 Function/Subroutine Documentation

49.31.1.1 fgsl_complex_poly_complex_eval()

```
complex(fgsl_double_complex) function fgsl_complex_poly_complex_eval (
             complex(fgsl_double_complex), dimension(:), intent(in) c,
             complex(fgsl_double_complex), intent(in) z )
```

49.31.1.2 fgsl_poly_complex_eval()

```
complex(fgsl_double_complex) function fgsl_poly_complex_eval (
             real(fgsl_double), dimension(:), intent(in), target, contiguous c,
             complex(fgsl_double_complex), intent(in) z )
```

49.31.1.3 fgsl_poly_complex_solve()

```
integer(fgsl_int) function fgsl_poly_complex_solve (
             real(fgsl_double), dimension(:), intent(in), target, contiguous a,
             integer(fgsl_size_t), intent(in) n,
             type(fgsl_poly_complex_workspace), intent(inout) w,
             complex(fgsl_double_complex), dimension(:), intent(out) z )
```

49.31.1.4 fgsl_poly_complex_solve_cubic()

```
integer(fgsl_int) function fgsl_poly_complex_solve_cubic (
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b,
             real(fgsl_double), intent(in) c,
             complex(fgsl_double_complex), intent(out) x0,
             complex(fgsl_double_complex), intent(out) x1,
             complex(fgsl_double_complex), intent(out) x2 )
```

49.31.1.5 fgsl_poly_complex_solve_quadratic()

```
integer(fgsl_int) function fgsl_poly_complex_solve_quadratic (
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b,
             real(fgsl_double), intent(in) c,
             complex(fgsl_double_complex), intent(out) x0,
             complex(fgsl_double_complex), intent(out) x1 )
```

49.31.1.6 fgsl_poly_complex_workspace_alloc()

```
type(fgsl_poly_complex_workspace) function fgsl_poly_complex_workspace_alloc (
             integer(fgsl_size_t), intent(in) n )
```

49.31.1.7 fgsl_poly_complex_workspace_free()

```
subroutine fgsl_poly_complex_workspace_free (
             type(fgsl_poly_complex_workspace), intent(inout) w )
```

49.31.1.8 fgsl_poly_complex_workspace_stat()

```
logical function fgsl_poly_complex_workspace_stat (
             type(fgsl_poly_complex_workspace), intent(in) w )
```

49.31.1.9 fgsl_poly_dd_eval()

```
real(fgsl_double) function fgsl_poly_dd_eval (
             real(fgsl_double), dimension(:), intent(in), target, contiguous dd,
             real(fgsl_double), dimension(:), intent(in), target, contiguous xa,
             real(fgsl_double), intent(in) x )
```

49.31.1.10 fgsl_poly_dd_hermite_init()

```
integer(fgsl_int) function fgsl_poly_dd_hermite_init (
             real(fgsl_double), dimension(:), intent(inout), target, contiguous dd,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous z,
             real(fgsl_double), dimension(:), intent(in), target, contiguous xa,
             real(fgsl_double), dimension(:), intent(in), target, contiguous ya,
             real(fgsl_double), dimension(:), intent(in), target, contiguous dya )
```

49.31.1.11 fgsl_poly_dd_init()

```
integer(fgsl_int) function fgsl_poly_dd_init (
             real(fgsl_double), dimension(:), intent(inout), target, contiguous dd,
             real(fgsl_double), dimension(:), intent(in), target, contiguous x,
             real(fgsl_double), dimension(:), intent(in), target, contiguous y )
```

49.31.1.12 fgsl_poly_dd_taylor()

```
integer(fgsl_int) function fgsl_poly_dd_taylor (
             real(fgsl_double), dimension(:), intent(inout), target, contiguous c,
             real(fgsl_double), intent(in) xp,
             real(fgsl_double), dimension(:), intent(in), target, contiguous dd,
             real(fgsl_double), dimension(:), intent(in), target, contiguous x,
             real(fgsl_double), dimension(:), intent(out), target, contiguous w )
```

49.31.1.13 fgsl_poly_eval()

```
real(fgsl_double) function fgsl_poly_eval (
             real(fgsl_double), dimension(:), intent(in), target, contiguous c,
             real(fgsl_double), intent(in) x )
```

49.31.1.14 fgsl_poly_eval_derivs()

```
integer(fgsl_int) function fgsl_poly_eval_derivs (
             real(fgsl_double), dimension(:), intent(in), target, contiguous c,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), dimension(:), target, contiguous res )
```

49.31.1.15 fgsl_poly_solve_cubic()

```
integer(fgsl_int) function fgsl_poly_solve_cubic (
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b,
             real(fgsl_double), intent(in) c,
             real(fgsl_double), intent(out) x0,
             real(fgsl_double), intent(out) x1,
             real(fgsl_double), intent(out) x2 )
```

49.31.1.16 fgsl_poly_solve_quadratic()

```
integer(fgsl_int) function fgsl_poly_solve_quadratic (
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b,
             real(fgsl_double), intent(in) c,
             real(fgsl_double), intent(out) x0,
             real(fgsl_double), intent(out) x1 )
```

49.32 api/rng.finc File Reference

Functions/Subroutines

- type(fgsl_rng) function fgsl_rng_alloc (t)
- subroutine fgsl_rng_set (r, s)
- subroutine fgsl_rng_free (r)
- integer(fgsl_long) function fgsl_rng_get (r)
- real(fgsl_double) function fgsl_rng_uniform (r)
- real(fgsl_double) function fgsl_rng_uniform_pos (r)
- integer(fgsl_long) function fgsl_rng_uniform_int (r, n)
- character(kind=fgsl_char, len=fgsl_strmax) function fgsl_rng_name (r)
- integer(fgsl_long) function fgsl_rng_max (r)
- integer(fgsl_long) function fgsl_rng_min (r)
- type(fgsl_rng_type) function fgsl_rng_env_setup ()
- integer(fgsl_int) function fgsl_rng_memcpy (cpy, src)
- type(fgsl_rng) function fgsl_rng_clone (r)
- integer(fgsl_int) function fgsl_rng_fwrite (stream, r)
- integer(fgsl_int) function fgsl_rng_fread (stream, r)
- type(fgsl_qrng) function fgsl_qrng_alloc (t, d)
- subroutine fgsl_qrng_free (r)
- subroutine fgsl_qrng_init (r)
- integer(fgsl_int) function fgsl_qrng_get (q, x)
- character(kind=fgsl_char, len=fgsl_strmax) function fgsl_qrng_name (q)
- integer(fgsl_int) function fgsl_qrng_memcpy (cpy, src)
- type(fgsl_qrng) function fgsl_qrng_clone (q)
- real(fgsl_double) function fgsl_ran_gaussian (r, sigma)
- real(fgsl_double) function fgsl_ran_gaussian_pdf (x, sigma)
- real(fgsl_double) function fgsl_ran_gaussian_ziggurat (r, sigma)
- real(fgsl_double) function fgsl_ran_gaussian_ratio_method (r, sigma)

- real(fgsl_double) function fgsl_ran_ugaussian (r)
- real(fgsl_double) function fgsl_ran_ugaussian_pdf (x)
- real(fgsl_double) function fgsl_ran_ugaussian_ratio_method (r)
- real(fgsl_double) function fgsl_cdf_gaussian_p (x, sigma)
- real(fgsl_double) function fgsl_cdf_gaussian_q (x, sigma)
- real(fgsl_double) function fgsl_cdf_gaussian_pinv (p, sigma)
- real(fgsl_double) function fgsl_cdf_gaussian_qinv (q, sigma)
- real(fgsl_double) function fgsl_cdf_ugaussian_p (x)
- real(fgsl_double) function fgsl_cdf_ugaussian_q (x)
- real(fgsl_double) function fgsl_cdf_ugaussian_pinv (p)
- real(fgsl_double) function fgsl_cdf_ugaussian_qinv (q)
- real(fgsl_double) function fgsl_ran_gaussian_tail (r, a, sigma)
- real(fgsl_double) function fgsl_ran_gaussian_tail_pdf (x, a, sigma)
- real(fgsl_double) function fgsl_ran_ugaussian_tail (r, a)
- real(fgsl_double) function fgsl_ran_ugaussian_tail_pdf (x, a)
- subroutine fgsl_ran_bivariate_gaussian (r, sigma_x, sigma_y, rho, x, y)
- real(fgsl_double) function fgsl_ran_bivariate_gaussian_pdf (x, y, sigma_x, sigma_y, rho)
- integer(fgsl_int) function fgsl_ran_multivariate_gaussian (r, mu, l, result)
- integer(fgsl_int) function fgsl_ran_multivariate_gaussian_pdf (x, mu, l, result, work)
- integer(fgsl_int) function fgsl_ran_multivariate_gaussian_log_pdf (x, mu, l, result, work)
- integer(fgsl_int) function fgsl_ran_multivariate_gaussian_mean (x, mu_hat)
- integer(fgsl_int) function fgsl_ran_multivariate_gaussian_vcov (x, sigma_hat)
- real(fgsl_double) function fgsl_ran_exponential (r, mu)
- real(fgsl_double) function fgsl_ran_exponential_pdf (x, mu)
- real(fgsl_double) function fgsl_cdf_exponential_p (x, mu)
- real(fgsl_double) function fgsl_cdf_exponential_q (x, mu)
- real(fgsl_double) function fgsl_cdf_exponential_pinv (p, mu)
- real(fgsl_double) function fgsl_cdf_exponential_qinv (q, mu)
- real(fgsl_double) function fgsl_ran_laplace (r, a)
- real(fgsl_double) function fgsl_ran_laplace_pdf (x, a)
- real(fgsl_double) function fgsl_cdf_laplace_p (x, a)
- real(fgsl_double) function fgsl_cdf_laplace_q (x, a)
- real(fgsl_double) function fgsl_cdf_laplace_pinv (p, a)
- real(fgsl_double) function fgsl_cdf_laplace_qinv (q, a)
- real(fgsl_double) function fgsl_ran_exppow (r, a, b)
- real(fgsl_double) function fgsl_ran_exppow_pdf (x, a, b)
- real(fgsl_double) function fgsl_cdf_exppow_p (x, a, b)
- real(fgsl_double) function fgsl_cdf_exppow_q (x, a, b)
- real(fgsl_double) function fgsl_ran_cauchy (r, a)
- real(fgsl_double) function fgsl_ran_cauchy_pdf (x, a)
- real(fgsl_double) function fgsl_cdf_cauchy_p (x, a)
- real(fgsl_double) function fgsl_cdf_cauchy_q (x, a)
- real(fgsl_double) function fgsl_cdf_cauchy_pinv (p, a)
- real(fgsl_double) function fgsl_cdf_cauchy_qinv (q, a)
- real(fgsl_double) function fgsl_ran_rayleigh (r, sigma)
- real(fgsl_double) function fgsl_ran_rayleigh_pdf (x, sigma)
- real(fgsl_double) function fgsl_cdf_rayleigh_p (x, sigma)
- real(fgsl_double) function fgsl_cdf_rayleigh_q (x, sigma)
- real(fgsl_double) function fgsl_cdf_rayleigh_pinv (p, sigma)
- real(fgsl_double) function fgsl_cdf_rayleigh_qinv (q, sigma)
- real(fgsl_double) function fgsl_ran_rayleigh_tail (r, a, sigma)
- real(fgsl_double) function fgsl_ran_rayleigh_tail_pdf (x, a, sigma)
- real(fgsl_double) function fgsl_ran_landau (r)
- real(fgsl_double) function fgsl_ran_landau_pdf (x)
- real(fgsl_double) function fgsl_ran_levy (r, c, alpha)

- real(fgsl_double) function fgsl_ran_levy_skew (r, c, alpha, beta)
- real(fgsl_double) function fgsl_ran_gamma (r, a, b)
- real(fgsl_double) function fgsl_ran_gamma_mt (r, a, b)
- real(fgsl_double) function fgsl_ran_gamma_pdf (x, a, b)
- real(fgsl_double) function fgsl_cdf_gamma_p (x, a, b)
- real(fgsl_double) function fgsl_cdf_gamma_q (x, a, b)
- real(fgsl_double) function fgsl_cdf_gamma_pinv (p, a, b)
- real(fgsl_double) function fgsl_cdf_gamma_qinv (q, a, b)
- real(fgsl_double) function fgsl_ran_flat (r, a, b)
- real(fgsl_double) function fgsl_ran_flat_pdf (x, a, b)
- real(fgsl_double) function fgsl_cdf_flat_p (x, a, b)
- real(fgsl_double) function fgsl_cdf_flat_q (x, a, b)
- real(fgsl_double) function fgsl_cdf_flat_pinv (p, a, b)
- real(fgsl_double) function fgsl_cdf_flat_qinv (q, a, b)
- real(fgsl_double) function fgsl_ran_lognormal (r, zeta, sigma)
- real(fgsl_double) function fgsl_ran_lognormal_pdf (x, zeta, sigma)
- real(fgsl_double) function fgsl_cdf_lognormal_p (x, zeta, sigma)
- real(fgsl_double) function fgsl_cdf_lognormal_q (x, zeta, sigma)
- real(fgsl_double) function fgsl_cdf_lognormal_pinv (p, zeta, sigma)
- real(fgsl_double) function fgsl_cdf_lognormal_qinv (q, zeta, sigma)
- real(fgsl_double) function fgsl_ran_chisq (r, nu)
- real(fgsl_double) function fgsl_ran_chisq_pdf (x, nu)
- real(fgsl_double) function fgsl_cdf_chisq_p (x, nu)
- real(fgsl_double) function fgsl_cdf_chisq_q (x, nu)
- real(fgsl_double) function fgsl_cdf_chisq_pinv (p, nu)
- real(fgsl_double) function fgsl_cdf_chisq_qinv (q, nu)
- real(fgsl_double) function fgsl_ran_fdist (r, nu1, nu2)
- real(fgsl_double) function fgsl_ran_fdist_pdf (x, nu1, nu2)
- real(fgsl_double) function fgsl_cdf_fdist_p (x, nu1, nu2)
- real(fgsl_double) function fgsl_cdf_fdist_q (x, nu1, nu2)
- real(fgsl_double) function fgsl_cdf_fdist_pinv (p, nu1, nu2)
- real(fgsl_double) function fgsl_cdf_fdist_qinv (q, nu1, nu2)
- real(fgsl_double) function fgsl_ran_tdist (r, nu)
- real(fgsl_double) function fgsl_ran_tdist_pdf (x, nu)
- real(fgsl_double) function fgsl_cdf_tdist_p (x, nu)
- real(fgsl_double) function fgsl_cdf_tdist_q (x, nu)
- real(fgsl_double) function fgsl_cdf_tdist_pinv (p, nu)
- real(fgsl_double) function fgsl_cdf_tdist_qinv (q, nu)
- real(fgsl_double) function fgsl_ran_beta (r, a, b)
- real(fgsl_double) function fgsl_ran_beta_pdf (x, a, b)
- real(fgsl_double) function fgsl_cdf_beta_p (x, a, b)
- real(fgsl_double) function fgsl_cdf_beta_q (x, a, b)
- real(fgsl_double) function fgsl_cdf_beta_pinv (p, a, b)
- real(fgsl_double) function fgsl_cdf_beta_qinv (q, a, b)
- real(fgsl_double) function fgsl_ran_logistic (r, a)
- real(fgsl_double) function fgsl_ran_logistic_pdf (x, a)
- real(fgsl_double) function fgsl_cdf_logistic_p (x, a)
- real(fgsl_double) function fgsl_cdf_logistic_q (x, a)
- real(fgsl_double) function fgsl_cdf_logistic_pinv (p, a)
- real(fgsl_double) function fgsl_cdf_logistic_qinv (q, a)
- real(fgsl_double) function fgsl_ran_pareto (r, a, b)
- real(fgsl_double) function fgsl_ran_pareto_pdf (x, a, b)
- real(fgsl_double) function fgsl_cdf_pareto_p (x, a, b)
- real(fgsl_double) function fgsl_cdf_pareto_q (x, a, b)
- real(fgsl_double) function fgsl_cdf_pareto_pinv (p, a, b)

- real(fgsl_double) function fgsl_cdf_pareto_qinv (q, a, b)
- subroutine fgsl_ran_dir_2d (r, x, y)
- subroutine fgsl_ran_dir_2d_trig_method (r, x, y)
- subroutine fgsl_ran_dir_3d (r, x, y, z)
- subroutine fgsl_ran_dir_nd (r, n, x)
- real(fgsl_double) function fgsl_ran_weibull (r, a, b)
- real(fgsl_double) function fgsl_ran_weibull_pdf (x, a, b)
- real(fgsl_double) function fgsl_cdf_weibull_p (x, a, b)
- real(fgsl_double) function fgsl_cdf_weibull_q (x, a, b)
- real(fgsl_double) function fgsl_cdf_weibull_pinv (p, a, b)
- real(fgsl_double) function fgsl_cdf_weibull_qinv (q, a, b)
- real(fgsl_double) function fgsl_ran_gumbel1 (r, a, b)
- real(fgsl_double) function fgsl_ran_gumbel1_pdf (x, a, b)
- real(fgsl_double) function fgsl_cdf_gumbel1_p (x, a, b)
- real(fgsl_double) function fgsl_cdf_gumbel1_q (x, a, b)
- real(fgsl_double) function fgsl_cdf_gumbel1_pinv (p, a, b)
- real(fgsl_double) function fgsl_cdf_gumbel1_qinv (q, a, b)
- real(fgsl_double) function fgsl_ran_gumbel2 (r, a, b)
- real(fgsl_double) function fgsl_ran_gumbel2_pdf (x, a, b)
- real(fgsl_double) function fgsl_cdf_gumbel2_p (x, a, b)
- real(fgsl_double) function fgsl_cdf_gumbel2_q (x, a, b)
- real(fgsl_double) function fgsl_cdf_gumbel2_pinv (p, a, b)
- real(fgsl_double) function fgsl_cdf_gumbel2_qinv (q, a, b)
- subroutine fgsl_ran_dirichlet (r, alpha, theta)
- real(fgsl_double) function fgsl_ran_dirichlet_pdf (alpha, theta)
- real(fgsl_double) function fgsl_ran_dirichlet_lnpdf (alpha, theta)
- type(fgsl_ran_discrete_t) function fgsl_ran_discrete_preproc (p)
- integer(fgsl_size_t) function fgsl_ran_discrete (r, g)
- real(fgsl_double) function fgsl_ran_discrete_pdf (k, g)
- subroutine fgsl_ran_discrete_free (g)
- integer(fgsl_int) function fgsl_ran_poisson (r, mu)
- real(fgsl_double) function fgsl_ran_poisson_pdf (k, mu)
- real(fgsl_double) function fgsl_cdf_poisson_p (k, mu)
- real(fgsl_double) function fgsl_cdf_poisson_q (k, mu)
- integer(fgsl_int) function fgsl_ran_bernoulli (r, p)
- real(fgsl_double) function fgsl_ran_bernoulli_pdf (k, p)
- real(fgsl_double) function fgsl_ran_binomial (r, p, n)
- real(fgsl_double) function fgsl_ran_binomial_pdf (k, p, n)
- real(fgsl_double) function fgsl_cdf_binomial_p (k, p, n)
- real(fgsl_double) function fgsl_cdf_binomial_q (k, p, n)
- subroutine fgsl_ran_multinomial (r, nn, p, n)
- real(fgsl_double) function fgsl_ran_multinomial_pdf (p, n)
- real(fgsl_double) function fgsl_ran_multinomial_lnpdf (p, n)
- integer(fgsl_int) function fgsl_ran_negative_binomial (r, p, n)
- real(fgsl_double) function fgsl_ran_negative_binomial_pdf (k, p, n)
- real(fgsl_double) function fgsl_cdf_negative_binomial_p (k, p, n)
- real(fgsl_double) function fgsl_cdf_negative_binomial_q (k, p, n)
- integer(fgsl_int) function fgsl_ran_pascal (r, p, n)
- real(fgsl_double) function fgsl_ran_pascal_pdf (k, p, n)
- real(fgsl_double) function fgsl_cdf_pascal_p (k, p, n)
- real(fgsl_double) function fgsl_cdf_pascal_q (k, p, n)
- integer(fgsl_int) function fgsl_ran_geometric (r, p)
- real(fgsl_double) function fgsl_ran_geometric_pdf (k, p)
- real(fgsl_double) function fgsl_cdf_geometric_p (k, p)
- real(fgsl_double) function fgsl_cdf_geometric_q (k, p)

- integer(fgsl_int) function fgsl_ran_hypergeometric (r, n1, n2, t)
- real(fgsl_double) function fgsl_ran_hypergeometric_pdf (k, n1, n2, t)
- real(fgsl_double) function fgsl_cdf_hypergeometric_p (k, n1, n2, t)
- real(fgsl_double) function fgsl_cdf_hypergeometric_q (k, n1, n2, t)
- integer(fgsl_int) function fgsl_ran_logarithmic (r, p)
- real(fgsl_double) function fgsl_ran_logarithmic_pdf (k, p)
- integer(fgsl_int) function fgsl_ran_wishart (r, df, l, result, work)
- integer(fgsl_int) function fgsl_ran_wishart_pdf (x, l_x, df, l, result, work)
- integer(fgsl_int) function fgsl_ran_wishart_log_pdf (x, l_x, df, l, result, work)
- subroutine fgsl_ran_shuffle (r, base, n, size)
- subroutine fgsl_ran_shuffle_double (r, base, n)
- subroutine fgsl_ran_shuffle_size_t (r, base, n)
- integer(fgsl_int) function fgsl_ran_choose (r, dest, k, src, n, size)
- subroutine fgsl_ran_sample (r, dest, k, src, n, size)
- subroutine fgsl_rng_c_ptr (res, src)
- logical function fgsl_rng_status (rng)
- logical function fgsl_qrng_status (qrng)
- logical function fgsl_ran_discrete_t_status (ran_discrete_t)

49.32.1 Function/Subroutine Documentation

49.32.1.1 fgsl_cdf_beta_p()

```
real(fgsl_double) function fgsl_cdf_beta_p (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.2 fgsl_cdf_beta_pinv()

```
real(fgsl_double) function fgsl_cdf_beta_pinv (
             real(fgsl_double), intent(in) p,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.3 fgsl_cdf_beta_q()

```
real(fgsl_double) function fgsl_cdf_beta_q (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.4 fgsl_cdf_beta_qinv()

```
real(fgsl_double) function fgsl_cdf_beta_qinv (
             real(fgsl_double), intent(in) q,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.5 fgsl_cdf_binomial_p()

```
real(fgsl_double) function fgsl_cdf_binomial_p (
             integer(fgsl_int), intent(in) k,
             real(fgsl_double), intent(in) p,
             integer(fgsl_int), intent(in) n )
```

49.32.1.6 fgsl_cdf_binomial_q()

```
real(fgsl_double) function fgsl_cdf_binomial_q (
             integer(fgsl_int), intent(in) k,
             real(fgsl_double), intent(in) p,
             integer(fgsl_int), intent(in) n )
```

49.32.1.7 fgsl_cdf_cauchy_p()

```
real(fgsl_double) function fgsl_cdf_cauchy_p (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) a )
```

49.32.1.8 fgsl_cdf_cauchy_pinv()

```
real(fgsl_double) function fgsl_cdf_cauchy_pinv (
             real(fgsl_double), intent(in) p,
             real(fgsl_double), intent(in) a )
```

49.32.1.9 fgsl_cdf_cauchy_q()

```
real(fgsl_double) function fgsl_cdf_cauchy_q (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) a )
```

49.32.1.10 fgsl_cdf_cauchy_qinv()

```
real(fgsl_double) function fgsl_cdf_cauchy_qinv (
             real(fgsl_double), intent(in) q,
             real(fgsl_double), intent(in) a )
```

49.32.1.11 fgsl_cdf_chisq_p()

```
real(fgsl_double) function fgsl_cdf_chisq_p (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) nu )
```

49.32.1.12 fgsl_cdf_chisq_pinv()

```
real(fgsl_double) function fgsl_cdf_chisq_pinv (
             real(fgsl_double), intent(in) p,
             real(fgsl_double), intent(in) nu )
```

49.32.1.13 fgsl_cdf_chisq_q()

```
real(fgsl_double) function fgsl_cdf_chisq_q (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) nu )
```

49.32.1.14 fgsl_cdf_chisq_qinv()

```
real(fgsl_double) function fgsl_cdf_chisq_qinv (
             real(fgsl_double), intent(in) q,
             real(fgsl_double), intent(in) nu )
```

49.32.1.15 fgsl_cdf_exponential_p()

```
real(fgsl_double) function fgsl_cdf_exponential_p (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) mu )
```

49.32.1.16 fgsl_cdf_exponential_pinv()

```
real(fgsl_double) function fgsl_cdf_exponential_pinv (
             real(fgsl_double), intent(in) p,
             real(fgsl_double), intent(in) mu )
```

49.32.1.17 fgsl_cdf_exponential_q()

```
real(fgsl_double) function fgsl_cdf_exponential_q (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) mu )
```

49.32.1.18 fgsl_cdf_exponential_qinv()

```
real(fgsl_double) function fgsl_cdf_exponential_qinv (
             real(fgsl_double), intent(in) q,
             real(fgsl_double), intent(in) mu )
```

49.32.1.19 fgsl_cdf_exppow_p()

```
real(fgsl_double) function fgsl_cdf_exppow_p (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.20 fgsl_cdf_exppow_q()

```
real(fgsl_double) function fgsl_cdf_exppow_q (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.21 fgsl_cdf_fdist_p()

```
real(fgsl_double) function fgsl_cdf_fdist_p (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) nu1,
             real(fgsl_double), intent(in) nu2 )
```

49.32.1.22 fgsl_cdf_fdist_pinv()

```
real(fgsl_double) function fgsl_cdf_fdist_pinv (
             real(fgsl_double), intent(in) p,
             real(fgsl_double), intent(in) nu1,
             real(fgsl_double), intent(in) nu2 )
```

49.32.1.23 fgsl_cdf_fdist_q()

```
real(fgsl_double) function fgsl_cdf_fdist_q (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) nu1,
             real(fgsl_double), intent(in) nu2 )
```

49.32.1.24 fgsl_cdf_fdist_qinv()

```
real(fgsl_double) function fgsl_cdf_fdist_qinv (
             real(fgsl_double), intent(in) q,
             real(fgsl_double), intent(in) nu1,
             real(fgsl_double), intent(in) nu2 )
```

49.32.1.25 fgsl_cdf_flat_p()

```
real(fgsl_double) function fgsl_cdf_flat_p (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.26 fgsl_cdf_flat_pinv()

```
real(fgsl_double) function fgsl_cdf_flat_pinv (
             real(fgsl_double), intent(in) p,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.27 fgsl_cdf_flat_q()

```
real(fgsl_double) function fgsl_cdf_flat_q (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.28 fgsl_cdf_flat_qinv()

```
real(fgsl_double) function fgsl_cdf_flat_qinv (
             real(fgsl_double), intent(in) q,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.29 fgsl_cdf_gamma_p()

```
real(fgsl_double) function fgsl_cdf_gamma_p (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.30 fgsl_cdf_gamma_pinv()

```
real(fgsl_double) function fgsl_cdf_gamma_pinv (
             real(fgsl_double), intent(in) p,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.31 fgsl_cdf_gamma_q()

```
real(fgsl_double) function fgsl_cdf_gamma_q (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.32 fgsl_cdf_gamma_qinv()

```
real(fgsl_double) function fgsl_cdf_gamma_qinv (
             real(fgsl_double), intent(in) q,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.33 fgsl_cdf_gaussian_p()

```
real(fgsl_double) function fgsl_cdf_gaussian_p (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) sigma )
```

49.32.1.34 fgsl_cdf_gaussian_pinv()

```
real(fgsl_double) function fgsl_cdf_gaussian_pinv (
             real(fgsl_double), intent(in) p,
             real(fgsl_double), intent(in) sigma )
```

49.32.1.35 fgsl_cdf_gaussian_q()

```
real(fgsl_double) function fgsl_cdf_gaussian_q (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) sigma )
```

49.32.1.36 fgsl_cdf_gaussian_qinv()

```
real(fgsl_double) function fgsl_cdf_gaussian_qinv (
             real(fgsl_double), intent(in) q,
             real(fgsl_double), intent(in) sigma )
```

49.32.1.37 fgsl_cdf_geometric_p()

```
real(fgsl_double) function fgsl_cdf_geometric_p (
             integer(fgsl_int), intent(in) k,
             real(fgsl_double), intent(in) p )
```

49.32.1.38 fgsl_cdf_geometric_q()

```
real(fgsl_double) function fgsl_cdf_geometric_q (
             integer(fgsl_int), intent(in) k,
             real(fgsl_double), intent(in) p )
```

49.32.1.39 fgsl_cdf_gumbel1_p()

```
real(fgsl_double) function fgsl_cdf_gumbel1_p (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.40 fgsl_cdf_gumbel1_pinv()

```
real(fgsl_double) function fgsl_cdf_gumbel1_pinv (
             real(fgsl_double), intent(in) p,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.41 fgsl_cdf_gumbel1_q()

```
real(fgsl_double) function fgsl_cdf_gumbel1_q (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.42 fgsl_cdf_gumbel1_qinv()

```
real(fgsl_double) function fgsl_cdf_gumbel1_qinv (
             real(fgsl_double), intent(in) q,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.43 fgsl_cdf_gumbel2_p()

```
real(fgsl_double) function fgsl_cdf_gumbel2_p (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.44 fgsl_cdf_gumbel2_pinv()

```
real(fgsl_double) function fgsl_cdf_gumbel2_pinv (
             real(fgsl_double), intent(in) p,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.45 fgsl_cdf_gumbel2_q()

```
real(fgsl_double) function fgsl_cdf_gumbel2_q (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.46 fgsl_cdf_gumbel2_qinv()

```
real(fgsl_double) function fgsl_cdf_gumbel2_qinv (
             real(fgsl_double), intent(in) q,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.47 fgsl_cdf_hypergeometric_p()

```
real(fgsl_double) function fgsl_cdf_hypergeometric_p (
             integer(fgsl_int), intent(in) k,
             integer(fgsl_int), intent(in) n1,
             integer(fgsl_int), intent(in) n2,
             integer(fgsl_int), intent(in) t )
```

49.32.1.48 fgsl_cdf_hypergeometric_q()

```
real(fgsl_double) function fgsl_cdf_hypergeometric_q (
             integer(fgsl_int), intent(in) k,
             integer(fgsl_int), intent(in) n1,
             integer(fgsl_int), intent(in) n2,
             integer(fgsl_int), intent(in) t )
```

49.32.1.49 fgsl_cdf_laplace_p()

```
real(fgsl_double) function fgsl_cdf_laplace_p (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) a )
```

49.32.1.50 fgsl_cdf_laplace_pinv()

```
real(fgsl_double) function fgsl_cdf_laplace_pinv (
             real(fgsl_double), intent(in) p,
             real(fgsl_double), intent(in) a )
```

49.32.1.51 fgsl_cdf_laplace_q()

```
real(fgsl_double) function fgsl_cdf_laplace_q (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) a )
```

49.32.1.52 fgsl_cdf_laplace_qinv()

```
real(fgsl_double) function fgsl_cdf_laplace_qinv (
             real(fgsl_double), intent(in) q,
             real(fgsl_double), intent(in) a )
```

49.32.1.53 fgsl_cdf_logistic_p()

```
real(fgsl_double) function fgsl_cdf_logistic_p (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) a )
```

49.32.1.54 fgsl_cdf_logistic_pinv()

```
real(fgsl_double) function fgsl_cdf_logistic_pinv (
             real(fgsl_double), intent(in) p,
             real(fgsl_double), intent(in) a )
```

49.32.1.55 fgsl_cdf_logistic_q()

```
real(fgsl_double) function fgsl_cdf_logistic_q (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) a )
```

49.32.1.56 fgsl_cdf_logistic_qinv()

```
real(fgsl_double) function fgsl_cdf_logistic_qinv (
             real(fgsl_double), intent(in) q,
             real(fgsl_double), intent(in) a )
```

49.32.1.57 fgsl_cdf_lognormal_p()

```
real(fgsl_double) function fgsl_cdf_lognormal_p (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) zeta,
             real(fgsl_double), intent(in) sigma )
```

49.32.1.58 fgsl_cdf_lognormal_pinv()

```
real(fgsl_double) function fgsl_cdf_lognormal_pinv (
             real(fgsl_double), intent(in) p,
             real(fgsl_double), intent(in) zeta,
             real(fgsl_double), intent(in) sigma )
```

49.32.1.59 fgsl_cdf_lognormal_q()

```
real(fgsl_double) function fgsl_cdf_lognormal_q (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) zeta,
             real(fgsl_double), intent(in) sigma )
```

49.32.1.60 fgsl_cdf_lognormal_qinv()

```
real(fgsl_double) function fgsl_cdf_lognormal_qinv (
             real(fgsl_double), intent(in) q,
             real(fgsl_double), intent(in) zeta,
             real(fgsl_double), intent(in) sigma )
```

49.32.1.61 fgsl_cdf_negative_binomial_p()

```
real(fgsl_double) function fgsl_cdf_negative_binomial_p (
             integer(fgsl_int), intent(in) k,
             real(fgsl_double), intent(in) p,
             real(fgsl_double), intent(in) n )
```

49.32.1.62 fgsl_cdf_negative_binomial_q()

```
real(fgsl_double) function fgsl_cdf_negative_binomial_q (
             integer(fgsl_int), intent(in) k,
             real(fgsl_double), intent(in) p,
             real(fgsl_double), intent(in) n )
```

49.32.1.63 fgsl_cdf_pareto_p()

```
real(fgsl_double) function fgsl_cdf_pareto_p (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.64 fgsl_cdf_pareto_pinv()

```
real(fgsl_double) function fgsl_cdf_pareto_pinv (
             real(fgsl_double), intent(in) p,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.65 fgsl_cdf_pareto_q()

```
real(fgsl_double) function fgsl_cdf_pareto_q (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.66 fgsl_cdf_pareto_qinv()

```
real(fgsl_double) function fgsl_cdf_pareto_qinv (
             real(fgsl_double), intent(in) q,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.67 fgsl_cdf_pascal_p()

```
real(fgsl_double) function fgsl_cdf_pascal_p (
             integer(fgsl_int), intent(in) k,
             real(fgsl_double), intent(in) p,
             real(fgsl_double), intent(in) n )
```

49.32.1.68 fgsl_cdf_pascal_q()

```
real(fgsl_double) function fgsl_cdf_pascal_q (
             integer(fgsl_int), intent(in) k,
             real(fgsl_double), intent(in) p,
             real(fgsl_double), intent(in) n )
```

49.32.1.69 fgsl_cdf_poisson_p()

```
real(fgsl_double) function fgsl_cdf_poisson_p (
             integer(fgsl_int), intent(in) k,
             real(fgsl_double), intent(in) mu )
```

49.32.1.70 fgsl_cdf_poisson_q()

```
real(fgsl_double) function fgsl_cdf_poisson_q (
             integer(fgsl_int), intent(in) k,
             real(fgsl_double), intent(in) mu )
```

49.32.1.71 fgsl_cdf_rayleigh_p()

```
real(fgsl_double) function fgsl_cdf_rayleigh_p (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) sigma )
```

49.32.1.72 fgsl_cdf_rayleigh_pinv()

```
real(fgsl_double) function fgsl_cdf_rayleigh_pinv (
             real(fgsl_double), intent(in) p,
             real(fgsl_double), intent(in) sigma )
```

49.32.1.73 fgsl_cdf_rayleigh_q()

```
real(fgsl_double) function fgsl_cdf_rayleigh_q (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) sigma )
```

49.32.1.74 fgsl_cdf_rayleigh_qinv()

```
real(fgsl_double) function fgsl_cdf_rayleigh_qinv (
             real(fgsl_double), intent(in) q,
             real(fgsl_double), intent(in) sigma )
```

49.32.1.75 fgsl_cdf_tdist_p()

```
real(fgsl_double) function fgsl_cdf_tdist_p (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) nu )
```

49.32.1.76 fgsl_cdf_tdist_pinv()

```
real(fgsl_double) function fgsl_cdf_tdist_pinv (
             real(fgsl_double), intent(in) p,
             real(fgsl_double), intent(in) nu )
```

49.32.1.77 fgsl_cdf_tdist_q()

```
real(fgsl_double) function fgsl_cdf_tdist_q (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) nu )
```

49.32.1.78 fgsl_cdf_tdist_qinv()

```
real(fgsl_double) function fgsl_cdf_tdist_qinv (
             real(fgsl_double), intent(in) q,
             real(fgsl_double), intent(in) nu )
```

49.32.1.79 fgsl_cdf_ugaussian_p()

```
real(fgsl_double) function fgsl_cdf_ugaussian_p (
             real(fgsl_double), intent(in) x )
```

49.32.1.80 fgsl_cdf_ugaussian_pinv()

```
real(fgsl_double) function fgsl_cdf_ugaussian_pinv (
             real(fgsl_double), intent(in) p )
```

49.32.1.81 fgsl_cdf_ugaussian_q()

```
real(fgsl_double) function fgsl_cdf_ugaussian_q (
             real(fgsl_double), intent(in) x )
```

49.32.1.82 fgsl_cdf_ugaussian_qinv()

```
real(fgsl_double) function fgsl_cdf_ugaussian_qinv (
             real(fgsl_double), intent(in) q )
```

49.32.1.83 fgsl_cdf_weibull_p()

```
real(fgsl_double) function fgsl_cdf_weibull_p (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.84 fgsl_cdf_weibull_pinv()

```
real(fgsl_double) function fgsl_cdf_weibull_pinv (
             real(fgsl_double), intent(in) p,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.85 fgsl_cdf_weibull_q()

```
real(fgsl_double) function fgsl_cdf_weibull_q (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.86 fgsl_cdf_weibull_qinv()

```
real(fgsl_double) function fgsl_cdf_weibull_qinv (
             real(fgsl_double), intent(in) q,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.87 fgsl_qrng_alloc()

```
type(fgsl_qrng) function fgsl_qrng_alloc (
             type(fgsl_qrng_type), intent(in) t,
             integer(fgsl_int), intent(in) d )
```

49.32.1.88 fgsl_qrng_clone()

```
type(fgsl_qrng) function fgsl_qrng_clone (
             type(fgsl_qrng), intent(in) q )
```

49.32.1.89 fgsl_qrng_free()

```
subroutine fgsl_qrng_free (
             type(fgsl_qrng), intent(inout) r )
```

49.32.1.90 fgsl_qrng_get()

```
integer(fgsl_int) function fgsl_qrng_get (
             type(fgsl_qrng), intent(in) q,
             real(fgsl_double), dimension(:), intent(out), target, contiguous x )
```

49.32.1.91 fgsl_qrng_init()

```
subroutine fgsl_qrng_init (
             type(fgsl_qrng), intent(inout) r )
```

49.32.1.92 fgsl_qrng_memcpy()

```
integer(fgsl_int) function fgsl_qrng_memcpy (
             type(fgsl_qrng), intent(inout) cpy,
             type(fgsl_qrng), intent(in) src )
```

49.32.1.93 fgsl_qrng_name()

```
character(kind=fgsl_char, len=fgsl_strmax) function fgsl_qrng_name (
             type(fgsl_qrng), intent(in) q )
```

49.32.1.94 fgsl_qrng_status()

```
logical function fgsl_qrng_status (
             type(fgsl_qrng), intent(in) qrng )
```

49.32.1.95 fgsl_ran_bernoulli()

```
integer(fgsl_int) function fgsl_ran_bernoulli (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(in) p )
```

49.32.1.96 fgsl_ran_bernoulli_pdf()

```
real(fgsl_double) function fgsl_ran_bernoulli_pdf (
             integer(fgsl_int), intent(in) k,
             real(fgsl_double), intent(in) p )
```

49.32.1.97 fgsl_ran_beta()

```
real(fgsl_double) function fgsl_ran_beta (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.98 fgsl_ran_beta_pdf()

```
real(fgsl_double) function fgsl_ran_beta_pdf (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.99 fgsl_ran_binomial()

```
real(fgsl_double) function fgsl_ran_binomial (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(in) p,
             integer(fgsl_int), intent(in) n )
```

49.32.1.100 fgsl_ran_binomial_pdf()

```
real(fgsl_double) function fgsl_ran_binomial_pdf (
             integer(fgsl_int), intent(in) k,
             real(fgsl_double), intent(in) p,
             integer(fgsl_int), intent(in) n )
```

49.32.1.101 fgsl_ran_bivariate_gaussian()

```
subroutine fgsl_ran_bivariate_gaussian (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(in) sigma_x,
             real(fgsl_double), intent(in) sigma_y,
             real(fgsl_double), intent(in) rho,
             real(fgsl_double), intent(out) x,
             real(fgsl_double), intent(out) y )
```

49.32.1.102 fgsl_ran_bivariate_gaussian_pdf()

```
real(fgsl_double) function fgsl_ran_bivariate_gaussian_pdf (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             real(fgsl_double), intent(in) sigma_x,
             real(fgsl_double), intent(in) sigma_y,
             real(fgsl_double), intent(in) rho )
```

49.32.1.103 fgsl_ran_cauchy()

```
real(fgsl_double) function fgsl_ran_cauchy (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(in) a )
```

49.32.1.104 fgsl_ran_cauchy_pdf()

```
real(fgsl_double) function fgsl_ran_cauchy_pdf (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) a )
```

49.32.1.105 fgsl_ran_chisq()

```
real(fgsl_double) function fgsl_ran_chisq (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(in) nu )
```

49.32.1.106 fgsl_ran_chisq_pdf()

```
real(fgsl_double) function fgsl_ran_chisq_pdf (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) nu )
```

49.32.1.107 fgsl_ran_choose()

```
integer(fgsl_int) function fgsl_ran_choose (
             type(fgsl_rng), intent(in) r,
             type(c_ptr), intent(in) dest,
             integer(fgsl_size_t), intent(in) k,
             type(c_ptr), intent(in) src,
             integer(fgsl_size_t), intent(in) n,
             integer(fgsl_size_t), intent(in) size )
```

49.32.1.108 fgsl_ran_dir_2d()

```
subroutine fgsl_ran_dir_2d (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(out) x,
             real(fgsl_double), intent(out) y )
```

49.32.1.109 fgsl_ran_dir_2d_trig_method()

```
subroutine fgsl_ran_dir_2d_trig_method (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(out) x,
             real(fgsl_double), intent(out) y )
```

49.32.1.110 fgsl_ran_dir_3d()

```
subroutine fgsl_ran_dir_3d (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(out) x,
             real(fgsl_double), intent(out) y,
             real(fgsl_double), intent(out) z )
```

49.32.1.111 fgsl_ran_dir_nd()

```
subroutine fgsl_ran_dir_nd (
             type(fgsl_rng), intent(in) r,
             integer(fgsl_size_t), intent(in) n,
             real(fgsl_double), intent(out) x )
```

49.32.1.112 fgsl_ran_dirichlet()

```
subroutine fgsl_ran_dirichlet (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), dimension(:), intent(in), target, contiguous alpha,
             real(fgsl_double), dimension(:), intent(out), target, contiguous theta )
```

49.32.1.113 fgsl_ran_dirichlet_lnpdf()

```
real(fgsl_double) function fgsl_ran_dirichlet_lnpdf (
             real(fgsl_double), dimension(:), intent(in), target, contiguous alpha,
             real(fgsl_double), dimension(:), intent(in), target, contiguous theta )
```

49.32.1.114 fgsl_ran_dirichlet_pdf()

```
real(fgsl_double) function fgsl_ran_dirichlet_pdf (
             real(fgsl_double), dimension(:), intent(in), target, contiguous alpha,
             real(fgsl_double), dimension(:), intent(in), target, contiguous theta )
```

49.32.1.115 fgsl_ran_discrete()

```
integer(fgsl_size_t) function fgsl_ran_discrete (
             type(fgsl_rng), intent(in) r,
             type(fgsl_ran_discrete_t), intent(in) g )
```

49.32.1.116 fgsl_ran_discrete_free()

```
subroutine fgsl_ran_discrete_free (
             type(fgsl_ran_discrete_t), intent(inout) g )
```

49.32.1.117 fgsl_ran_discrete_pdf()

```
real(fgsl_double) function fgsl_ran_discrete_pdf (
             integer(fgsl_size_t), intent(in) k,
             type(fgsl_ran_discrete_t), intent(in) g )
```

49.32.1.118 fgsl_ran_discrete_preproc()

```
type(fgsl_ran_discrete_t) function fgsl_ran_discrete_preproc (
             real(fgsl_double), dimension(:), intent(in), target, contiguous p )
```

49.32.1.119 fgsl_ran_discrete_t_status()

```
logical function fgsl_ran_discrete_t_status (
             type(fgsl_ran_discrete_t), intent(in) ran_discrete_t )
```

49.32.1.120 fgsl_ran_exponential()

```
real(fgsl_double) function fgsl_ran_exponential (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(in) mu )
```

49.32.1.121 fgsl_ran_exponential_pdf()

```
real(fgsl_double) function fgsl_ran_exponential_pdf (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) mu )
```

49.32.1.122 fgsl_ran_exppow()

```
real(fgsl_double) function fgsl_ran_exppow (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.123 fgsl_ran_exppow_pdf()

```
real(fgsl_double) function fgsl_ran_exppow_pdf (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.124 fgsl_ran_fdist()

```
real(fgsl_double) function fgsl_ran_fdist (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(in) nu1,
             real(fgsl_double), intent(in) nu2 )
```

49.32.1.125 fgsl_ran_fdist_pdf()

```
real(fgsl_double) function fgsl_ran_fdist_pdf (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) nu1,
             real(fgsl_double), intent(in) nu2 )
```

49.32.1.126 fgsl_ran_flat()

```
real(fgsl_double) function fgsl_ran_flat (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.127 fgsl_ran_flat_pdf()

```
real(fgsl_double) function fgsl_ran_flat_pdf (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.128 fgsl_ran_gamma()

```
real(fgsl_double) function fgsl_ran_gamma (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.129 fgsl_ran_gamma_mt()

```
real(fgsl_double) function fgsl_ran_gamma_mt (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.130 fgsl_ran_gamma_pdf()

```
real(fgsl_double) function fgsl_ran_gamma_pdf (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.131 fgsl_ran_gaussian()

```
real(fgsl_double) function fgsl_ran_gaussian (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(in) sigma )
```

49.32.1.132 fgsl_ran_gaussian_pdf()

```
real(fgsl_double) function fgsl_ran_gaussian_pdf (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) sigma )
```

49.32.1.133 fgsl_ran_gaussian_ratio_method()

```
real(fgsl_double) function fgsl_ran_gaussian_ratio_method (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(in) sigma )
```

49.32.1.134 fgsl_ran_gaussian_tail()

```
real(fgsl_double) function fgsl_ran_gaussian_tail (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) sigma )
```

49.32.1.135 fgsl_ran_gaussian_tail_pdf()

```
real(fgsl_double) function fgsl_ran_gaussian_tail_pdf (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) sigma )
```

49.32.1.136 fgsl_ran_gaussian_ziggurat()

```
real(fgsl_double) function fgsl_ran_gaussian_ziggurat (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(in) sigma )
```

49.32.1.137 fgsl_ran_geometric()

```
integer(fgsl_int) function fgsl_ran_geometric (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(in) p )
```

49.32.1.138 fgsl_ran_geometric_pdf()

```
real(fgsl_double) function fgsl_ran_geometric_pdf (
             integer(fgsl_int), intent(in) k,
             real(fgsl_double), intent(in) p )
```

49.32.1.139 fgsl_ran_gumbel1()

```
real(fgsl_double) function fgsl_ran_gumbel1 (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.140 fgsl_ran_gumbel1_pdf()

```
real(fgsl_double) function fgsl_ran_gumbel1_pdf (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.141 fgsl_ran_gumbel2()

```
real(fgsl_double) function fgsl_ran_gumbel2 (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.142 fgsl_ran_gumbel2_pdf()

```
real(fgsl_double) function fgsl_ran_gumbel2_pdf (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.143 fgsl_ran_hypergeometric()

```
integer(fgsl_int) function fgsl_ran_hypergeometric (
             type(fgsl_rng), intent(in) r,
             integer(fgsl_int), intent(in) n1,
             integer(fgsl_int), intent(in) n2,
             integer(fgsl_int), intent(in) t )
```

49.32.1.144 fgsl_ran_hypergeometric_pdf()

```
real(fgsl_double) function fgsl_ran_hypergeometric_pdf (
             integer(fgsl_int), intent(in) k,
             integer(fgsl_int), intent(in) n1,
             integer(fgsl_int), intent(in) n2,
             integer(fgsl_int), intent(in) t )
```

49.32.1.145 fgsl_ran_landau()

```
real(fgsl_double) function fgsl_ran_landau (
             type(fgsl_rng), intent(in) r )
```

49.32.1.146 fgsl_ran_landau_pdf()

```
real(fgsl_double) function fgsl_ran_landau_pdf (
             real(fgsl_double), intent(in) x )
```

49.32.1.147 fgsl_ran_laplace()

```
real(fgsl_double) function fgsl_ran_laplace (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(in) a )
```

49.32.1.148 fgsl_ran_laplace_pdf()

```
real(fgsl_double) function fgsl_ran_laplace_pdf (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) a )
```

49.32.1.149 fgsl_ran_levy()

```
real(fgsl_double) function fgsl_ran_levy (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(in) c,
             real(fgsl_double), intent(in) alpha )
```

49.32.1.150 fgsl_ran_levy_skew()

```
real(fgsl_double) function fgsl_ran_levy_skew (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(in) c,
             real(fgsl_double), intent(in) alpha,
             real(fgsl_double), intent(in) beta )
```

49.32.1.151 fgsl_ran_logarithmic()

```
integer(fgsl_int) function fgsl_ran_logarithmic (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(in) p )
```

49.32.1.152 fgsl_ran_logarithmic_pdf()

```
real(fgsl_double) function fgsl_ran_logarithmic_pdf (
             integer(fgsl_int), intent(in) k,
             real(fgsl_double), intent(in) p )
```

49.32.1.153 fgsl_ran_logistic()

```
real(fgsl_double) function fgsl_ran_logistic (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(in) a )
```

49.32.1.154 fgsl_ran_logistic_pdf()

```
real(fgsl_double) function fgsl_ran_logistic_pdf (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) a )
```

49.32.1.155 fgsl_ran_lognormal()

```
real(fgsl_double) function fgsl_ran_lognormal (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(in) zeta,
             real(fgsl_double), intent(in) sigma )
```

49.32.1.156 fgsl_ran_lognormal_pdf()

```
real(fgsl_double) function fgsl_ran_lognormal_pdf (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) zeta,
             real(fgsl_double), intent(in) sigma )
```

49.32.1.157 fgsl_ran_multinomial()

```
subroutine fgsl_ran_multinomial (
             type(fgsl_rng), intent(in) r,
             integer(fgsl_int), intent(in) nn,
             real(fgsl_double), dimension(:), intent(in), target, contiguous p,
             integer(fgsl_int), dimension(:), intent(out), target, contiguous n )
```

49.32.1.158 fgsl_ran_multinomial_lnpdf()

```
real(fgsl_double) function fgsl_ran_multinomial_lnpdf (
             real(fgsl_double), dimension(:), intent(in), target, contiguous p,
             integer(fgsl_int), dimension(:), intent(in), target, contiguous n )
```

49.32.1.159 fgsl_ran_multinomial_pdf()

```
real(fgsl_double) function fgsl_ran_multinomial_pdf (
             real(fgsl_double), dimension(:), intent(in), target, contiguous p,
             integer(fgsl_int), dimension(:), intent(in), target, contiguous n )
```

49.32.1.160 fgsl_ran_multivariate_gaussian()

```
integer(fgsl_int) function fgsl_ran_multivariate_gaussian (
             type(fgsl_rng), intent(in) r,
             type(fgsl_vector), intent(in) mu,
             type(fgsl_matrix), intent(in) l,
             type(fgsl_vector), intent(inout) result )
```

49.32.1.161 fgsl_ran_multivariate_gaussian_log_pdf()

```
integer(fgsl_int) function fgsl_ran_multivariate_gaussian_log_pdf (
             type(fgsl_vector), intent(in) x,
             type(fgsl_vector), intent(in) mu,
             type(fgsl_matrix), intent(in) l,
             real(fgsl_double), intent(inout) result,
             type(fgsl_vector), intent(inout) work )
```

49.32.1.162 fgsl_ran_multivariate_gaussian_mean()

```
integer(fgsl_int) function fgsl_ran_multivariate_gaussian_mean (
             type(fgsl_matrix), intent(in) x,
             type(fgsl_vector), intent(inout) mu_hat )
```

49.32.1.163 fgsl_ran_multivariate_gaussian_pdf()

```
integer(fgsl_int) function fgsl_ran_multivariate_gaussian_pdf (
             type(fgsl_vector), intent(in) x,
             type(fgsl_vector), intent(in) mu,
             type(fgsl_matrix), intent(in) l,
             real(fgsl_double), intent(inout) result,
             type(fgsl_vector), intent(inout) work )
```

49.32.1.164 fgsl_ran_multivariate_gaussian_vcov()

```
integer(fgsl_int) function fgsl_ran_multivariate_gaussian_vcov (
             type(fgsl_matrix), intent(in) x,
             type(fgsl_matrix), intent(inout) sigma_hat )
```

49.32.1.165 fgsl_ran_negative_binomial()

```
integer(fgsl_int) function fgsl_ran_negative_binomial (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(in) p,
             real(fgsl_double), intent(in) n )
```

49.32.1.166 fgsl_ran_negative_binomial_pdf()

```
real(fgsl_double) function fgsl_ran_negative_binomial_pdf (
             integer(fgsl_int), intent(in) k,
             real(fgsl_double), intent(in) p,
             real(fgsl_double), intent(in) n )
```

49.32.1.167 fgsl_ran_pareto()

```
real(fgsl_double) function fgsl_ran_pareto (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.168 fgsl_ran_pareto_pdf()

```
real(fgsl_double) function fgsl_ran_pareto_pdf (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.169 fgsl_ran_pascal()

```
integer(fgsl_int) function fgsl_ran_pascal (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(in) p,
             real(fgsl_double), intent(in) n )
```

49.32.1.170 fgsl_ran_pascal_pdf()

```
real(fgsl_double) function fgsl_ran_pascal_pdf (
             integer(fgsl_int), intent(in) k,
             real(fgsl_double), intent(in) p,
             real(fgsl_double), intent(in) n )
```

49.32.1.171 fgsl_ran_poisson()

```
integer(fgsl_int) function fgsl_ran_poisson (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(in) mu )
```

49.32.1.172 fgsl_ran_poisson_pdf()

```
real(fgsl_double) function fgsl_ran_poisson_pdf (
             integer(fgsl_int), intent(in) k,
             real(fgsl_double), intent(in) mu )
```

49.32.1.173 fgsl_ran_rayleigh()

```
real(fgsl_double) function fgsl_ran_rayleigh (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(in) sigma )
```

49.32.1.174 fgsl_ran_rayleigh_pdf()

```
real(fgsl_double) function fgsl_ran_rayleigh_pdf (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) sigma )
```

49.32.1.175 fgsl_ran_rayleigh_tail()

```
real(fgsl_double) function fgsl_ran_rayleigh_tail (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) sigma )
```

49.32.1.176 fgsl_ran_rayleigh_tail_pdf()

```
real(fgsl_double) function fgsl_ran_rayleigh_tail_pdf (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) sigma )
```

49.32.1.177 fgsl_ran_sample()

```
subroutine fgsl_ran_sample (
             type(fgsl_rng), intent(in) r,
             type(c_ptr), intent(in) dest,
             integer(fgsl_size_t), intent(in) k,
             type(c_ptr), intent(in) src,
             integer(fgsl_size_t), intent(in) n,
             integer(fgsl_size_t), intent(in) size )
```

49.32.1.178 fgsl_ran_shuffle()

```
subroutine fgsl_ran_shuffle (
             type(fgsl_rng), intent(in) r,
             type(c_ptr), intent(in) base,
             integer(fgsl_size_t), intent(in) n,
             integer(fgsl_size_t), intent(in) size )
```

49.32.1.179 fgsl_ran_shuffle_double()

```
subroutine fgsl_ran_shuffle_double (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), dimension(n), intent(in), target base,
             integer(fgsl_size_t), intent(in) n )
```

49.32.1.180 fgsl_ran_shuffle_size_t()

```
subroutine fgsl_ran_shuffle_size_t (
             type(fgsl_rng), intent(in) r,
             integer(fgsl_size_t), dimension(n), intent(in), target base,
             integer(fgsl_size_t), intent(in) n )
```

49.32.1.181 fgsl_ran_tdist()

```
real(fgsl_double) function fgsl_ran_tdist (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(in) nu )
```

49.32.1.182 fgsl_ran_tdist_pdf()

```
real(fgsl_double) function fgsl_ran_tdist_pdf (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) nu )
```

49.32.1.183 fgsl_ran_ugaussian()

```
real(fgsl_double) function fgsl_ran_ugaussian (
             type(fgsl_rng), intent(in) r )
```

49.32.1.184 fgsl_ran_ugaussian_pdf()

```
real(fgsl_double) function fgsl_ran_ugaussian_pdf (
             real(fgsl_double), intent(in) x )
```

49.32.1.185 fgsl_ran_ugaussian_ratio_method()

```
real(fgsl_double) function fgsl_ran_ugaussian_ratio_method (
             type(fgsl_rng), intent(in) r )
```

49.32.1.186 fgsl_ran_ugaussian_tail()

```
real(fgsl_double) function fgsl_ran_ugaussian_tail (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(in) a )
```

49.32.1.187 fgsl_ran_ugaussian_tail_pdf()

```
real(fgsl_double) function fgsl_ran_ugaussian_tail_pdf (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) a )
```

49.32.1.188 fgsl_ran_weibull()

```
real(fgsl_double) function fgsl_ran_weibull (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.189 fgsl_ran_weibull_pdf()

```
real(fgsl_double) function fgsl_ran_weibull_pdf (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b )
```

49.32.1.190 fgsl_ran_wishart()

```
integer(fgsl_int) function fgsl_ran_wishart (
             type(fgsl_rng), intent(in) r,
             real(fgsl_double), intent(in) df,
             type(fgsl_matrix), intent(in) l,
             type(fgsl_matrix), intent(inout) result,
             type(fgsl_matrix), intent(inout) work )
```

49.32.1.191 fgsl_ran_wishart_log_pdf()

```
integer(fgsl_int) function fgsl_ran_wishart_log_pdf (
             type(fgsl_matrix), intent(in) x,
             type(fgsl_matrix), intent(in) l_x,
             real(fgsl_double), intent(in) df,
             type(fgsl_matrix), intent(in) l,
             real(fgsl_double), intent(inout) result,
             type(fgsl_matrix), intent(inout) work )
```

49.32.1.192 fgsl_ran_wishart_pdf()

```
integer(fgsl_int) function fgsl_ran_wishart_pdf (
             type(fgsl_matrix), intent(in) x,
             type(fgsl_matrix), intent(in) l_x,
             real(fgsl_double), intent(in) df,
             type(fgsl_matrix), intent(in) l,
             real(fgsl_double), intent(inout) result,
             type(fgsl_matrix), intent(inout) work )
```

49.32.1.193 fgsl_rng_alloc()

```
type(fgsl_rng) function fgsl_rng_alloc (
             type(fgsl_rng_type), intent(inout) t )
```

49.32.1.194 fgsl_rng_c_ptr()

```
subroutine fgsl_rng_c_ptr (
             type(fgsl_rng), intent(out) res,
             type(c_ptr), intent(in) src )
```

49.32.1.195 fgsl_rng_clone()

```
type(fgsl_rng) function fgsl_rng_clone (
             type(fgsl_rng), intent(in) r )
```

49.32.1.196 fgsl_rng_env_setup()

```
type(fgsl_rng_type) function fgsl_rng_env_setup
```

49.32.1.197 fgsl_rng_fread()

```
integer(fgsl_int) function fgsl_rng_fread (
             type(fgsl_file), intent(in) stream,
             type(fgsl_rng), intent(inout) r )
```

49.32.1.198 fgsl_rng_free()

```
subroutine fgsl_rng_free (
             type(fgsl_rng), intent(inout) r )
```

49.32.1.199 fgsl_rng_fwrite()

```
integer(fgsl_int) function fgsl_rng_fwrite (
             type(fgsl_file), intent(in) stream,
             type(fgsl_rng), intent(in) r )
```

49.32.1.200 fgsl_rng_get()

```
integer(fgsl_long) function fgsl_rng_get (
             type(fgsl_rng), intent(in) r )
```

49.32.1.201 fgsl_rng_max()

```
integer(fgsl_long) function fgsl_rng_max (
             type(fgsl_rng), intent(in) r )
```

49.32.1.202 fgsl_rng_memcpy()

```
integer(fgsl_int) function fgsl_rng_memcpy (
             type(fgsl_rng), intent(inout) cpy,
             type(fgsl_rng), intent(in) src )
```

49.32.1.203 fgsl_rng_min()

```
integer(fgsl_long) function fgsl_rng_min (
             type(fgsl_rng), intent(in) r )
```

49.32.1.204 fgsl_rng_name()

```
character(kind=fgsl_char, len=fgsl_strmax) function fgsl_rng_name (
             type(fgsl_rng), intent(in) r )
```

49.32.1.205 fgsl_rng_set()

```
subroutine fgsl_rng_set (
             type(fgsl_rng), intent(inout) r,
             integer(fgsl_long), intent(in) s )
```

49.32.1.206 fgsl_rng_status()

```
logical function fgsl_rng_status (
             type(fgsl_rng), intent(in) rng )
```

49.32.1.207 fgsl_rng_uniform()

```
real(fgsl_double) function fgsl_rng_uniform (
             type(fgsl_rng), intent(in) r )
```

49.32.1.208 fgsl_rng_uniform_int()

```
integer(fgsl_long) function fgsl_rng_uniform_int (
             type(fgsl_rng), intent(in) r,
             integer(fgsl_long), intent(in) n )
```

49.32.1.209 fgsl_rng_uniform_pos()

```
real(fgsl_double) function fgsl_rng_uniform_pos (
             type(fgsl_rng), intent(in) r )
```

49.33 api/roots.finc File Reference

Functions/Subroutines

- type(fgsl_root_fsolver) function fgsl_root_fsolver_alloc (t)
- type(fgsl_root_fdfsolver) function fgsl_root_fdfsolver_alloc (t)
- integer(fgsl_int) function fgsl_root_fsolver_set (s, f, x_lower, x_upper)
- integer(fgsl_int) function fgsl_root_fdfsolver_set (s, fdf, x)
- subroutine fgsl_root_fsolver_free (s)
- subroutine fgsl_root_fdfsolver_free (s)
- character(kind=fgsl_char, len=fgsl_strmax) function fgsl_root_fsolver_name (s)
- character(kind=fgsl_char, len=fgsl_strmax) function fgsl_root_fdfsolver_name (s)
- integer(fgsl_int) function fgsl_root_fsolver_iterate (s)
- integer(fgsl_int) function fgsl_root_fdfsolver_iterate (s)
- real(fgsl_double) function fgsl_root_fsolver_root (s)
- real(fgsl_double) function fgsl_root_fdfsolver_root (s)
- real(fgsl_double) function fgsl_root_fsolver_x_lower (s)
- real(fgsl_double) function fgsl_root_fsolver_x_upper (s)
- integer(fgsl_int) function fgsl_root_test_interval (x_lower, x_upper, epsabs, epsrel)
- integer(fgsl_int) function fgsl_root_test_delta (x1, x0, epsabs, epsrel)
- integer(fgsl_int) function fgsl_root_test_residual (f, epsabs)
- logical function fgsl_root_fsolver_status (s)
- logical function fgsl_root_fdfsolver_status (s)

49.33.1 Function/Subroutine Documentation

49.33.1.1 fgsl_root_fdfsolver_alloc()

```
type(fgsl_root_fdfsolver) function fgsl_root_fdfsolver_alloc (
             type(fgsl_root_fdfsolver_type), intent(in) t )
```

49.33.1.2 fgsl_root_fdfsolver_free()

```
subroutine fgsl_root_fdfsolver_free (
             type(fgsl_root_fdfsolver), intent(inout) s )
```

49.33.1.3 fgsl_root_fdfsolver_iterate()

```
integer(fgsl_int) function fgsl_root_fdfsolver_iterate (
             type(fgsl_root_fdfsolver), intent(inout) s )
```

49.33.1.4 fgsl_root_fdfsolver_name()

```
character(kind=fgsl_char,len=fgsl_strmax) function fgsl_root_fdfsolver_name (
             type(fgsl_root_fdfsolver), intent(in) s )
```

49.33.1.5 fgsl_root_fdfsolver_root()

```
real(fgsl_double) function fgsl_root_fdfsolver_root (
             type(fgsl_root_fdfsolver), intent(inout) s )
```

49.33.1.6 fgsl_root_fdfsolver_set()

```
integer(fgsl_int) function fgsl_root_fdfsolver_set (
             type(fgsl_root_fdfsolver), intent(in) s,
             type(fgsl_function_fdf), intent(in) fdf,
             real(fgsl_double), intent(in) x )
```

49.33.1.7 fgsl_root_fdfsolver_status()

```
logical function fgsl_root_fdfsolver_status (
            type(fgsl_root_fdfsolver), intent(in) s )
```

49.33.1.8 fgsl_root_fsolver_alloc()

```
type(fgsl_root_fsolver) function fgsl_root_fsolver_alloc (
            type(fgsl_root_fsolver_type), intent(in) t )
```

49.33.1.9 fgsl_root_fsolver_free()

```
subroutine fgsl_root_fsolver_free (
            type(fgsl_root_fsolver), intent(inout) s )
```

49.33.1.10 fgsl_root_fsolver_iterate()

```
integer(fgsl_int) function fgsl_root_fsolver_iterate (
            type(fgsl_root_fsolver), intent(inout) s )
```

49.33.1.11 fgsl_root_fsolver_name()

```
character(kind=fgsl_char,len=fgsl_strmax) function fgsl_root_fsolver_name (
            type(fgsl_root_fsolver), intent(in) s )
```

49.33.1.12 fgsl_root_fsolver_root()

```
real(fgsl_double) function fgsl_root_fsolver_root (
            type(fgsl_root_fsolver), intent(inout) s )
```

49.33.1.13 fgsl_root_fsolver_set()

```
integer(fgsl_int) function fgsl_root_fsolver_set (
            type(fgsl_root_fsolver), intent(in) s,
            type(fgsl_function), intent(in) f,
            real(fgsl_double), intent(in) x_lower,
            real(fgsl_double), intent(in) x_upper )
```

49.33.1.14 fgsl_root_fsolver_status()

```
logical function fgsl_root_fsolver_status (
             type(fgsl_root_fsolver), intent(in) s )
```

49.33.1.15 fgsl_root_fsolver_x_lower()

```
real(fgsl_double) function fgsl_root_fsolver_x_lower (
             type(fgsl_root_fsolver), intent(inout) s )
```

49.33.1.16 fgsl_root_fsolver_x_upper()

```
real(fgsl_double) function fgsl_root_fsolver_x_upper (
             type(fgsl_root_fsolver), intent(inout) s )
```

49.33.1.17 fgsl_root_test_delta()

```
integer(fgsl_int) function fgsl_root_test_delta (
             real(fgsl_double), intent(in) x1,
             real(fgsl_double), intent(in) x0,
             real(fgsl_double), intent(in) epsabs,
             real(fgsl_double), intent(in) epsrel )
```

49.33.1.18 fgsl_root_test_interval()

```
integer(fgsl_int) function fgsl_root_test_interval (
             real(fgsl_double), intent(in) x_lower,
             real(fgsl_double), intent(in) x_upper,
             real(fgsl_double), intent(in) epsabs,
             real(fgsl_double), intent(in) epsrel )
```

49.33.1.19 fgsl_root_test_residual()

```
integer(fgsl_int) function fgsl_root_test_residual (
             real(fgsl_double), intent(in) f,
             real(fgsl_double), intent(in) epsabs )
```

49.34 api/rstat.finc File Reference

Functions/Subroutines

- type(fgsl_rstat_quantile_workspace) function fgsl_rstat_quantile_alloc (p)
- subroutine fgsl_rstat_quantile_free (w)
- integer(fgsl_int) function fgsl_rstat_quantile_reset (w)
- integer(fgsl_int) function fgsl_rstat_quantile_add (x, w)
- real(fgsl_double) function fgsl_rstat_quantile_get (w)
- type(fgsl_rstat_workspace) function fgsl_rstat_alloc ()
- subroutine fgsl_rstat_free (w)
- integer(fgsl_size_t) function fgsl_rstat_n (w)
- integer(fgsl_int) function fgsl_rstat_add (x, w)
- real(fgsl_double) function fgsl_rstat_min (w)
- real(fgsl_double) function fgsl_rstat_max (w)
- real(fgsl_double) function fgsl_rstat_mean (w)
- real(fgsl_double) function fgsl_rstat_rms (w)
- real(fgsl_double) function fgsl_rstat_variance (w)
- real(fgsl_double) function fgsl_rstat_sd (w)
- real(fgsl_double) function fgsl_rstat_sd_mean (w)
- real(fgsl_double) function fgsl_rstat_median (w)
- real(fgsl_double) function fgsl_rstat_skew (w)
- real(fgsl_double) function fgsl_rstat_kurtosis (w)
- integer(fgsl_int) function fgsl_rstat_reset (w)

49.34.1 Function/Subroutine Documentation

49.34.1.1 fgsl_rstat_add()

```
integer(fgsl_int) function fgsl_rstat_add (
             real(fgsl_double), value x,
             type(fgsl_rstat_workspace), intent(inout) w )
```

49.34.1.2 fgsl_rstat_alloc()

```
type(fgsl_rstat_workspace) function fgsl_rstat_alloc
```

49.34.1.3 fgsl_rstat_free()

```
subroutine fgsl_rstat_free (
             type(fgsl_rstat_workspace), intent(inout) w )
```

49.34.1.4 fgsl_rstat_kurtosis()

```
real(fgsl_double) function fgsl_rstat_kurtosis (
             type(fgsl_rstat_workspace), intent(inout) w )
```

49.34.1.5 fgsl_rstat_max()

```
real(fgsl_double) function fgsl_rstat_max (
             type(fgsl_rstat_workspace), intent(inout) w )
```

49.34.1.6 fgsl_rstat_mean()

```
real(fgsl_double) function fgsl_rstat_mean (
             type(fgsl_rstat_workspace), intent(inout) w )
```

49.34.1.7 fgsl_rstat_median()

```
real(fgsl_double) function fgsl_rstat_median (
             type(fgsl_rstat_workspace), intent(inout) w )
```

49.34.1.8 fgsl_rstat_min()

```
real(fgsl_double) function fgsl_rstat_min (
             type(fgsl_rstat_workspace), intent(inout) w )
```

49.34.1.9 fgsl_rstat_n()

```
integer(fgsl_size_t) function fgsl_rstat_n (
             type(fgsl_rstat_workspace), intent(inout) w )
```

49.34.1.10 fgsl_rstat_quantile_add()

```
integer(fgsl_int) function fgsl_rstat_quantile_add (
             real(fgsl_double), intent(in) x,
             type(fgsl_rstat_quantile_workspace), intent(inout) w )
```

49.34.1.11 fgsl_rstat_quantile_alloc()

```
type(fgsl_rstat_quantile_workspace) function fgsl_rstat_quantile_alloc (
            real(fgsl_double), intent(in) p )
```

49.34.1.12 fgsl_rstat_quantile_free()

```
subroutine fgsl_rstat_quantile_free (
            type(fgsl_rstat_quantile_workspace), intent(inout) w )
```

49.34.1.13 fgsl_rstat_quantile_get()

```
real(fgsl_double) function fgsl_rstat_quantile_get (
            type(fgsl_rstat_quantile_workspace), intent(inout) w )
```

49.34.1.14 fgsl_rstat_quantile_reset()

```
integer(fgsl_int) function fgsl_rstat_quantile_reset (
            type(fgsl_rstat_quantile_workspace), intent(inout) w )
```

49.34.1.15 fgsl_rstat_reset()

```
integer(fgsl_int) function fgsl_rstat_reset (
            type(fgsl_rstat_workspace), intent(inout) w )
```

49.34.1.16 fgsl_rstat_rms()

```
real(fgsl_double) function fgsl_rstat_rms (
            type(fgsl_rstat_workspace), intent(inout) w )
```

49.34.1.17 fgsl_rstat_sd()

```
real(fgsl_double) function fgsl_rstat_sd (
            type(fgsl_rstat_workspace), intent(inout) w )
```

49.34.1.18 fgsl_rstat_sd_mean()

```
real(fgsl_double) function fgsl_rstat_sd_mean (
             type(fgsl_rstat_workspace), intent(inout) w )
```

49.34.1.19 fgsl_rstat_skew()

```
real(fgsl_double) function fgsl_rstat_skew (
             type(fgsl_rstat_workspace), intent(inout) w )
```

49.34.1.20 fgsl_rstat_variance()

```
real(fgsl_double) function fgsl_rstat_variance (
             type(fgsl_rstat_workspace), intent(inout) w )
```

49.35 api/siman.finc File Reference

Functions/Subroutines

- subroutine fgsl_siman_params_init (params, n_tries, iters_fixed_t, step_size, k, t_initial, mu_t, t_min)
- subroutine fgsl_siman_params_free (params)
- subroutine fgsl_siman_solve (rng, x0_p, ef, take_step, distance, print_position, copy_func, copy_constructor, destructor, element_size, params)
- logical function fgsl_siman_params_t_status (siman_params_t)

49.35.1 Function/Subroutine Documentation

49.35.1.1 fgsl_siman_params_free()

```
subroutine fgsl_siman_params_free (
             type(fgsl_siman_params_t), intent(inout) params )
```

49.35.1.2 fgsl_siman_params_init()

```
subroutine fgsl_siman_params_init (
             type(fgsl_siman_params_t), intent(inout) params,
             integer(fgsl_int) n_tries,
             integer(fgsl_int) iters_fixed_t,
             real(fgsl_double) step_size,
             real(fgsl_double) k,
             real(fgsl_double) t_initial,
             real(fgsl_double) mu_t,
             real(fgsl_double) t_min )
```

49.35.1.3 fgsl_siman_params_t_status()

```
logical function fgsl_siman_params_t_status (
             type(fgsl_siman_params_t), intent(in) siman_params_t )
```

49.35.1.4 fgsl_siman_solve()

```
subroutine fgsl_siman_solve (
             type(fgsl_rng), intent(in) rng,
             type(c_ptr), intent(inout) x0_p,
              ef,
              take_step,
              distance,
             optional print_position,
             optional copy_func,
             optional copy_constructor,
             optional destructor,
             integer(fgsl_size_t), intent(in), optional element_size,
             type(fgsl_siman_params_t), intent(in) params )
```

49.36 api/sort.finc File Reference

Functions/Subroutines

- subroutine fgsl_heapsort (array, count, size, compare)
- integer(fgsl_int) function fgsl_heapsort_index (p, array, count, size, compare)
- subroutine fgsl_sort_double (data, stride, n)
- subroutine fgsl_sort_double_index (p, data, stride, n)
- integer(fgsl_int) function fgsl_sort_double_smallest (dest, k, src, stride, n)
- integer(fgsl_int) function fgsl_sort_double_smallest_index (p, k, src, stride, n)
- integer(fgsl_int) function fgsl_sort_double_largest (dest, k, src, stride, n)
- integer(fgsl_int) function fgsl_sort_double_largest_index (p, k, src, stride, n)
- subroutine fgsl_sort_long (data, stride, n)
- subroutine fgsl_sort_long_index (p, data, stride, n)
- integer(fgsl_int) function fgsl_sort_long_smallest (dest, k, src, stride, n)

- integer(fgsl_int) function fgsl_sort_long_smallest_index (p, k, src, stride, n)
- integer(fgsl_int) function fgsl_sort_long_largest (dest, k, src, stride, n)
- integer(fgsl_int) function fgsl_sort_long_largest_index (p, k, src, stride, n)
- subroutine fgsl_sort_vector (v)
- subroutine fgsl_sort_vector2 (v1, v2)
- subroutine fgsl_sort_vector_index (p, v)
- integer(fgsl_int) function fgsl_sort_vector_smallest (dest, k, v)
- integer(fgsl_int) function fgsl_sort_vector_largest (dest, k, v)
- integer(fgsl_int) function fgsl_sort_vector_smallest_index (p, k, v)
- integer(fgsl_int) function fgsl_sort_vector_largest_index (p, k, v)

49.36.1 Function/Subroutine Documentation

49.36.1.1 fgsl_heapsort()

```
subroutine fgsl_heapsort (
             type(c_ptr) array,
             integer(fgsl_size_t), intent(in) count,
             integer(fgsl_size_t), intent(in) size,
              compare )
```

49.36.1.2 fgsl_heapsort_index()

```
integer(fgsl_int) function fgsl_heapsort_index (
             integer(fgsl_size_t), dimension(count), intent(out), target p,
             type(c_ptr) array,
             integer(fgsl_size_t), intent(in) count,
             integer(fgsl_size_t), intent(in) size,
              compare )
```

49.36.1.3 fgsl_sort_double()

```
subroutine fgsl_sort_double (
             real(fgsl_double), dimension(:), intent(inout), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.36.1.4 fgsl_sort_double_index()

```
subroutine fgsl_sort_double_index (
             integer(fgsl_size_t), dimension(:), intent(out), target, contiguous p,
             real(fgsl_double), dimension(:), intent(in), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.36.1.5 fgsl_sort_double_largest()

```
integer(fgsl_int) function fgsl_sort_double_largest (
             real(fgsl_double), dimension(k), intent(out), target dest,
             integer(fgsl_size_t), intent(in) k,
             real(fgsl_double), dimension(:), intent(in), target, contiguous src,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.36.1.6 fgsl_sort_double_largest_index()

```
integer(fgsl_int) function fgsl_sort_double_largest_index (
             integer(fgsl_size_t), dimension(k), intent(out), target p,
             integer(fgsl_size_t), intent(in) k,
             real(fgsl_double), dimension(:), intent(in), target, contiguous src,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.36.1.7 fgsl_sort_double_smallest()

```
integer(fgsl_int) function fgsl_sort_double_smallest (
             real(fgsl_double), dimension(k), intent(out), target dest,
             integer(fgsl_size_t), intent(in) k,
             real(fgsl_double), dimension(:), intent(in), target, contiguous src,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.36.1.8 fgsl_sort_double_smallest_index()

```
integer(fgsl_int) function fgsl_sort_double_smallest_index (
             integer(fgsl_size_t), dimension(k), intent(out), target p,
             integer(fgsl_size_t), intent(in) k,
             real(fgsl_double), dimension(:), intent(in), target, contiguous src,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.36.1.9 fgsl_sort_long()

```
subroutine fgsl_sort_long (
             integer(fgsl_long), dimension(:), intent(inout), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.36.1.10 fgsl_sort_long_index()

```
subroutine fgsl_sort_long_index (
             integer(fgsl_size_t), dimension(:), intent(out), target, contiguous p,
             integer(fgsl_long), dimension(:), intent(in), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.36.1.11 fgsl_sort_long_largest()

```
integer(fgsl_int) function fgsl_sort_long_largest (
             integer(fgsl_long), dimension(k), intent(out), target dest,
             integer(fgsl_size_t), intent(in) k,
             integer(fgsl_long), dimension(:), intent(in), target, contiguous src,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.36.1.12 fgsl_sort_long_largest_index()

```
integer(fgsl_int) function fgsl_sort_long_largest_index (
             integer(fgsl_size_t), dimension(k), intent(out), target p,
             integer(fgsl_size_t), intent(in) k,
             integer(fgsl_long), dimension(:), intent(in), target, contiguous src,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.36.1.13 fgsl_sort_long_smallest()

```
integer(fgsl_int) function fgsl_sort_long_smallest (
             integer(fgsl_long), dimension(k), intent(out), target dest,
             integer(fgsl_size_t), intent(in) k,
             integer(fgsl_long), dimension(:), intent(in), target, contiguous src,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.36.1.14 fgsl_sort_long_smallest_index()

```
integer(fgsl_int) function fgsl_sort_long_smallest_index (
             integer(fgsl_size_t), dimension(k), intent(out), target p,
             integer(fgsl_size_t), intent(in) k,
             integer(fgsl_long), dimension(:), intent(in), target, contiguous src,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.36.1.15 fgsl_sort_vector()

```
subroutine fgsl_sort_vector (
             type(fgsl_vector), intent(inout) v )
```

49.36.1.16 fgsl_sort_vector2()

```
subroutine fgsl_sort_vector2 (
             type(fgsl_vector), intent(inout) v1,
             type(fgsl_vector), intent(inout) v2 )
```

49.36.1.17 fgsl_sort_vector_index()

```
subroutine fgsl_sort_vector_index (
             type(fgsl_permutation), intent(inout) p,
             type(fgsl_vector), intent(in) v )
```

49.36.1.18 fgsl_sort_vector_largest()

```
integer(fgsl_int) function fgsl_sort_vector_largest (
             real(fgsl_double), dimension(k), intent(out) dest,
             integer(fgsl_size_t), intent(in) k,
             type(fgsl_vector), intent(inout) v )
```

49.36.1.19 fgsl_sort_vector_largest_index()

```
integer(fgsl_int) function fgsl_sort_vector_largest_index (
             integer(fgsl_size_t), dimension(k), intent(out) p,
             integer(fgsl_size_t), intent(in) k,
             type(fgsl_vector), intent(inout) v )
```

49.36.1.20 fgsl_sort_vector_smallest()

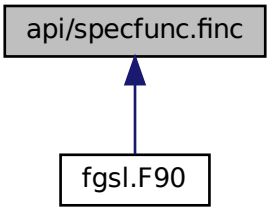
```
integer(fgsl_int) function fgsl_sort_vector_smallest (
             real(fgsl_double), dimension(k), intent(out) dest,
             integer(fgsl_size_t), intent(in) k,
             type(fgsl_vector), intent(inout) v )
```

49.36.1.21 fgsl_sort_vector_smallest_index()

```
integer(fgsl_int) function fgsl_sort_vector_smallest_index (
             integer(fgsl_size_t), dimension(k), intent(out) p,
             integer(fgsl_size_t), intent(in) k,
             type(fgsl_vector), intent(inout) v )
```

49.37 api/specfunc.finc File Reference

This graph shows which files directly or indirectly include this file:



Functions/Subroutines

- real(fgsl_double) function fgsl_sf_airy_ai (x, mode)
- integer(fgsl_int) function fgsl_sf_airy_ai_e (x, mode, result)
- real(fgsl_double) function fgsl_sf_airy_bi (x, mode)
- integer(fgsl_int) function fgsl_sf_airy_bi_e (x, mode, result)
- real(fgsl_double) function fgsl_sf_airy_ai_scaled (x, mode)
- integer(fgsl_int) function fgsl_sf_airy_ai_scaled_e (x, mode, result)
- real(fgsl_double) function fgsl_sf_airy_bi_scaled (x, mode)
- integer(fgsl_int) function fgsl_sf_airy_bi_scaled_e (x, mode, result)
- real(fgsl_double) function fgsl_sf_airy_ai_deriv (x, mode)
- integer(fgsl_int) function fgsl_sf_airy_ai_deriv_e (x, mode, result)
- real(fgsl_double) function fgsl_sf_airy_bi_deriv (x, mode)
- integer(fgsl_int) function fgsl_sf_airy_bi_deriv_e (x, mode, result)
- real(fgsl_double) function fgsl_sf_airy_ai_deriv_scaled (x, mode)
- integer(fgsl_int) function fgsl_sf_airy_ai_deriv_scaled_e (x, mode, result)

- real(fgsl_double) function fgsl_sf_airy_bi_deriv_scaled (x, mode)
- integer(fgsl_int) function fgsl_sf_airy_bi_deriv_scaled_e (x, mode, result)
- real(fgsl_double) function fgsl_sf_airy_zero_ai (s)
- integer(fgsl_int) function fgsl_sf_airy_zero_ai_e (s, result)
- real(fgsl_double) function fgsl_sf_airy_zero_bi (s)
- integer(fgsl_int) function fgsl_sf_airy_zero_bi_e (s, result)
- real(fgsl_double) function fgsl_sf_airy_zero_ai_deriv (s)
- integer(fgsl_int) function fgsl_sf_airy_zero_ai_deriv_e (s, result)
- real(fgsl_double) function fgsl_sf_airy_zero_bi_deriv (s)
- integer(fgsl_int) function fgsl_sf_airy_zero_bi_deriv_e (s, result)
- integer(fgsl_int) function fgsl_sf_bessel_jc0_e (x, result)
- integer(fgsl_int) function fgsl_sf_bessel_jc1_e (x, result)
- integer(fgsl_int) function fgsl_sf_bessel_jcn_e (n, x, result)
- integer(fgsl_int) function fgsl_sf_bessel_yc0_e (x, result)
- integer(fgsl_int) function fgsl_sf_bessel_yc1_e (x, result)
- integer(fgsl_int) function fgsl_sf_bessel_ycn_e (n, x, result)
- integer(fgsl_int) function fgsl_sf_bessel_ic0_e (x, result)
- integer(fgsl_int) function fgsl_sf_bessel_ic1_e (x, result)
- integer(fgsl_int) function fgsl_sf_bessel_icn_e (n, x, result)
- integer(fgsl_int) function fgsl_sf_bessel_ic0_scaled_e (x, result)
- integer(fgsl_int) function fgsl_sf_bessel_ic1_scaled_e (x, result)
- integer(fgsl_int) function fgsl_sf_bessel_icn_scaled_e (n, x, result)
- integer(fgsl_int) function fgsl_sf_bessel_kc0_e (x, result)
- integer(fgsl_int) function fgsl_sf_bessel_kc1_e (x, result)
- integer(fgsl_int) function fgsl_sf_bessel_kcn_e (n, x, result)
- integer(fgsl_int) function fgsl_sf_bessel_kc0_scaled_e (x, result)
- integer(fgsl_int) function fgsl_sf_bessel_kc1_scaled_e (x, result)
- integer(fgsl_int) function fgsl_sf_bessel_kcn_scaled_e (n, x, result)
- integer(fgsl_int) function fgsl_sf_bessel_js0_e (x, result)
- integer(fgsl_int) function fgsl_sf_bessel_js1_e (x, result)
- integer(fgsl_int) function fgsl_sf_bessel_js2_e (x, result)
- integer(fgsl_int) function fgsl_sf_bessel_jsl_e (n, x, result)
- integer(fgsl_int) function fgsl_sf_bessel_ys0_e (x, result)
- integer(fgsl_int) function fgsl_sf_bessel_ys1_e (x, result)
- integer(fgsl_int) function fgsl_sf_bessel_ys2_e (x, result)
- integer(fgsl_int) function fgsl_sf_bessel_ysl_e (n, x, result)
- integer(fgsl_int) function fgsl_sf_bessel_is0_scaled_e (x, result)
- integer(fgsl_int) function fgsl_sf_bessel_is1_scaled_e (x, result)
- integer(fgsl_int) function fgsl_sf_bessel_is2_scaled_e (x, result)
- integer(fgsl_int) function fgsl_sf_bessel_isl_scaled_e (n, x, result)
- integer(fgsl_int) function fgsl_sf_bessel_ks0_scaled_e (x, result)
- integer(fgsl_int) function fgsl_sf_bessel_ks1_scaled_e (x, result)
- integer(fgsl_int) function fgsl_sf_bessel_ks2_scaled_e (x, result)
- integer(fgsl_int) function fgsl_sf_bessel_ksl_scaled_e (n, x, result)
- integer(fgsl_int) function fgsl_sf_bessel_jnu_e (n, x, result)
- integer(fgsl_int) function fgsl_sf_bessel_sequence_jnu_e (nu, mode, v)
- integer(fgsl_int) function fgsl_sf_bessel_ynu_e (n, x, result)
- integer(fgsl_int) function fgsl_sf_bessel_inu_e (n, x, result)
- integer(fgsl_int) function fgsl_sf_bessel_inu_scaled_e (n, x, result)
- integer(fgsl_int) function fgsl_sf_bessel_knu_e (n, x, result)
- integer(fgsl_int) function fgsl_sf_bessel_lnknu_e (n, x, result)
- integer(fgsl_int) function fgsl_sf_bessel_knu_scaled_e (n, x, result)
- integer(fgsl_int) function fgsl_sf_bessel_zero_jc0_e (s, result)
- integer(fgsl_int) function fgsl_sf_bessel_zero_jc1_e (s, result)
- integer(fgsl_int) function fgsl_sf_bessel_zero_jnu_e (nu, s, result)

- integer(fgsl_int) function fgsl_sf_clausen_e (x, result)
- integer(fgsl_int) function fgsl_sf_hydrogenicr_1_e (z, r, result)
- integer(fgsl_int) function fgsl_sf_hydrogenicr_e (n, l, z, r, result)
- integer(fgsl_int) function fgsl_sf_coulomb_wave_fg_e (eta, x, l_f, k, f, fp, g, gp, exp_f, exp_g)
- integer(fgsl_int) function fgsl_sf_coulomb_wave_f_array (l_min, eta, x, fc_array, f_exponent)
- integer(fgsl_int) function fgsl_sf_coulomb_wave_fg_array (l_min, eta, x, fc_array, gc_array, f_exponent, g_↩ exponent)
- integer(fgsl_int) function fgsl_sf_coulomb_wave_fgp_array (l_min, eta, x, fc_array, fcp_array, gc_array, gcp↩ _array, f_exponent, g_exponent)
- integer(fgsl_int) function fgsl_sf_coulomb_wave_sphf_array (l_min, eta, x, fc_array, f_exponent)
- integer(fgsl_int) function fgsl_sf_coulomb_cl_e (l, eta, result)
- integer(fgsl_int) function fgsl_sf_coulomb_cl_array (l_min, eta, cl)
- integer(fgsl_int) function fgsl_sf_coupling_3j_e (two_ja, two_jb, two_jc, two_ma, two_mb, two_mc, result)
- integer(fgsl_int) function fgsl_sf_coupling_6j_e (two_ja, two_jb, two_jc, two_jd, two_je, two_jf, result)
- integer(fgsl_int) function fgsl_sf_coupling_9j_e (two_ja, two_jb, two_jc, two_jd, two_je, two_jf, two_jg, two_jh, two_ji, result)
- integer(fgsl_int) function fgsl_sf_dawson_e (x, result)
- integer(fgsl_int) function fgsl_sf_debye_1_e (x, result)
- integer(fgsl_int) function fgsl_sf_debye_2_e (x, result)
- integer(fgsl_int) function fgsl_sf_debye_3_e (x, result)
- integer(fgsl_int) function fgsl_sf_debye_4_e (x, result)
- integer(fgsl_int) function fgsl_sf_debye_5_e (x, result)
- integer(fgsl_int) function fgsl_sf_debye_6_e (x, result)
- integer(fgsl_int) function fgsl_sf_dilog_e (x, result)
- integer(fgsl_int) function fgsl_sf_complex_dilog_e (r, theta, result_re, result_im)
- integer(fgsl_int) function fgsl_sf_multiply_e (x, y, result)
- integer(fgsl_int) function fgsl_sf_multiply_err_e (x, dx, y, dy, result)
- real(fgsl_double) function fgsl_sf_ellint_kcomp (k, mode)
- integer(fgsl_int) function fgsl_sf_ellint_kcomp_e (k, mode, result)
- real(fgsl_double) function fgsl_sf_ellint_ecomp (k, mode)
- integer(fgsl_int) function fgsl_sf_ellint_ecomp_e (k, mode, result)
- real(fgsl_double) function fgsl_sf_ellint_pcomp (k, n, mode)
- integer(fgsl_int) function fgsl_sf_ellint_pcomp_e (k, n, mode, result)
- real(fgsl_double) function fgsl_sf_ellint_f (phi, k, mode)
- integer(fgsl_int) function fgsl_sf_ellint_f_e (phi, k, mode, result)
- real(fgsl_double) function fgsl_sf_ellint_e (phi, k, mode)
- integer(fgsl_int) function fgsl_sf_ellint_e_e (phi, k, mode, result)
- real(fgsl_double) function fgsl_sf_ellint_p (phi, k, n, mode)
- integer(fgsl_int) function fgsl_sf_ellint_p_e (phi, k, n, mode, result)
- real(fgsl_double) function fgsl_sf_ellint_d (phi, k, mode)
- integer(fgsl_int) function fgsl_sf_ellint_d_e (phi, k, mode, result)
- real(fgsl_double) function fgsl_sf_ellint_rc (x, y, mode)
- integer(fgsl_int) function fgsl_sf_ellint_rc_e (x, y, mode, result)
- real(fgsl_double) function fgsl_sf_ellint_rd (x, y, z, mode)
- integer(fgsl_int) function fgsl_sf_ellint_rd_e (x, y, z, mode, result)
- real(fgsl_double) function fgsl_sf_ellint_rf (x, y, z, mode)
- integer(fgsl_int) function fgsl_sf_ellint_rf_e (x, y, z, mode, result)
- real(fgsl_double) function fgsl_sf_ellint_rj (x, y, z, p, mode)
- integer(fgsl_int) function fgsl_sf_ellint_rj_e (x, y, z, p, mode, result)
- integer(fgsl_int) function fgsl_sf_erf_e (x, result)
- integer(fgsl_int) function fgsl_sf_erfc_e (x, result)
- integer(fgsl_int) function fgsl_sf_log_erfc_e (x, result)
- integer(fgsl_int) function fgsl_sf_erf_z_e (x, result)
- integer(fgsl_int) function fgsl_sf_erf_q_e (x, result)
- integer(fgsl_int) function fgsl_sf_hazard_e (x, result)

- integer(fgsl_int) function fgsl_sf_exp_e (x, result)
- integer(fgsl_int) function fgsl_sf_exp_e10_e (x, result)
- integer(fgsl_int) function fgsl_sf_exp_mult_e (x, y, result)
- integer(fgsl_int) function fgsl_sf_exp_mult_e10_e (x, y, result)
- integer(fgsl_int) function fgsl_sf_expm1_e (x, result)
- integer(fgsl_int) function fgsl_sf_exprel_e (x, result)
- integer(fgsl_int) function fgsl_sf_exprel_2_e (x, result)
- integer(fgsl_int) function fgsl_sf_exprel_n_e (n, x, result)
- integer(fgsl_int) function fgsl_sf_exp_err_e (x, dx, result)
- integer(fgsl_int) function fgsl_sf_exp_err_e10_e (x, dx, result)
- integer(fgsl_int) function fgsl_sf_exp_mult_err_e (x, dx, y, dy, result)
- integer(fgsl_int) function fgsl_sf_exp_mult_err_e10_e (x, dx, y, dy, result)
- integer(fgsl_int) function fgsl_sf_expint_e1_e (x, result)
- integer(fgsl_int) function fgsl_sf_expint_e2_e (x, result)
- integer(fgsl_int) function fgsl_sf_expint_en_e (n, x, result)
- integer(fgsl_int) function fgsl_sf_expint_ei_e (x, result)
- integer(fgsl_int) function fgsl_sf_shi_e (x, result)
- integer(fgsl_int) function fgsl_sf_chi_e (x, result)
- integer(fgsl_int) function fgsl_sf_expint_3_e (x, result)
- integer(fgsl_int) function fgsl_sf_si_e (x, result)
- integer(fgsl_int) function fgsl_sf_ci_e (x, result)
- integer(fgsl_int) function fgsl_sf_atanint_e (x, result)
- integer(fgsl_int) function fgsl_sf_fermi_dirac_m1_e (x, result)
- integer(fgsl_int) function fgsl_sf_fermi_dirac_0_e (x, result)
- integer(fgsl_int) function fgsl_sf_fermi_dirac_1_e (x, result)
- integer(fgsl_int) function fgsl_sf_fermi_dirac_2_e (x, result)
- integer(fgsl_int) function fgsl_sf_fermi_dirac_int_e (i, x, result)
- integer(fgsl_int) function fgsl_sf_fermi_dirac_mhalf_e (x, result)
- integer(fgsl_int) function fgsl_sf_fermi_dirac_half_e (x, result)
- integer(fgsl_int) function fgsl_sf_fermi_dirac_3half_e (x, result)
- integer(fgsl_int) function fgsl_sf_fermi_dirac_inc_0_e (x, b, result)
- integer(fgsl_int) function fgsl_sf_gamma_e (x, result)
- integer(fgsl_int) function fgsl_sf_lngamma_e (x, result)
- integer(fgsl_int) function fgsl_sf_lngamma_sgn_e (x, result_lg, sgn)
- integer(fgsl_int) function fgsl_sf_gammastar_e (x, result)
- integer(fgsl_int) function fgsl_sf_gammainv_e (x, result)
- integer(fgsl_int) function fgsl_sf_lngamma_complex_e (zr, zi, lnr, arg)
- integer(fgsl_int) function fgsl_sf_fact_e (n, result)
- integer(fgsl_int) function fgsl_sf_doublefact_e (n, result)
- integer(fgsl_int) function fgsl_sf_lnfact_e (n, result)
- integer(fgsl_int) function fgsl_sf_lndoublefact_e (n, result)
- integer(fgsl_int) function fgsl_sf_choose_e (n, m, result)
- integer(fgsl_int) function fgsl_sf_lnchoose_e (n, m, result)
- integer(fgsl_int) function fgsl_sf_taylorcoeff_e (n, x, result)
- integer(fgsl_int) function fgsl_sf_poch_e (a, x, result)
- integer(fgsl_int) function fgsl_sf_lnpoch_e (a, x, result)
- integer(fgsl_int) function fgsl_sf_lnpoch_sgn_e (a, x, result_lg, sgn)
- integer(fgsl_int) function fgsl_sf_pochrel_e (a, x, result)
- integer(fgsl_int) function fgsl_sf_gamma_inc_e (a, x, result)
- integer(fgsl_int) function fgsl_sf_gamma_inc_q_e (a, x, result)
- integer(fgsl_int) function fgsl_sf_gamma_inc_p_e (a, x, result)
- integer(fgsl_int) function fgsl_sf_beta_e (a, b, result)
- integer(fgsl_int) function fgsl_sf_lnbeta_e (a, b, result)
- integer(fgsl_int) function fgsl_sf_beta_inc_e (a, b, x, result)
- integer(fgsl_int) function fgsl_sf_gegenpoly_1_e (lambda, x, result)

- integer(fgsl_int) function fgsl_sf_gegenpoly_2_e (lambda, x, result)
- integer(fgsl_int) function fgsl_sf_gegenpoly_3_e (lambda, x, result)
- integer(fgsl_int) function fgsl_sf_gegenpoly_n_e (n, lambda, x, result)
- integer(fgsl_int) function fgsl_sf_gegenpoly_array (lambda, x, result_array)
- integer(fgsl_int) function fgsl_sf_hermite_prob_e (n, x, result)
- integer(fgsl_int) function fgsl_sf_hermite_prob_series_e (n, x, a, result)
- integer(fgsl_int) function fgsl_sf_hermite_phys_e (n, x, result)
- integer(fgsl_int) function fgsl_sf_hermite_phys_series_e (n, x, a, result)
- integer(fgsl_int) function fgsl_sf_hermite_func_e (n, x, result)
- integer(fgsl_int) function fgsl_sf_hermite_func_series_e (n, x, a, result)
- integer(fgsl_int) function fgsl_sf_hyperg_0f1_e (c, x, result)
- integer(fgsl_int) function fgsl_sf_hyperg_1f1_int_e (m, n, x, result)
- integer(fgsl_int) function fgsl_sf_hyperg_1f1_e (a, b, x, result)
- integer(fgsl_int) function fgsl_sf_hyperg_u_int_e (m, n, x, result)
- integer(fgsl_int) function fgsl_sf_hyperg_u_int_e10_e (m, n, x, result)
- integer(fgsl_int) function fgsl_sf_hyperg_u_e (a, b, x, result)
- integer(fgsl_int) function fgsl_sf_hyperg_u_e10_e (a, b, x, result)
- integer(fgsl_int) function fgsl_sf_hyperg_2f1_e (a, b, c, x, result)
- integer(fgsl_int) function fgsl_sf_hyperg_2f1_conj_e (ar, ai, c, x, result)
- integer(fgsl_int) function fgsl_sf_hyperg_2f1_renorm_e (a, b, c, x, result)
- integer(fgsl_int) function fgsl_sf_hyperg_2f1_conj_renorm_e (ar, ai, c, x, result)
- integer(fgsl_int) function fgsl_sf_hyperg_2f0_e (a, b, x, result)
- integer(fgsl_int) function fgsl_sf_laguerre_1_e (a, x, result)
- integer(fgsl_int) function fgsl_sf_laguerre_2_e (a, x, result)
- integer(fgsl_int) function fgsl_sf_laguerre_3_e (a, x, result)
- integer(fgsl_int) function fgsl_sf_laguerre_n_e (n, a, x, result)
- integer(fgsl_int) function fgsl_sf_lambert_w0_e (x, result)
- integer(fgsl_int) function fgsl_sf_lambert_wm1_e (x, result)
- integer(fgsl_int) function fgsl_sf_legendre_p1_e (x, result)
- integer(fgsl_int) function fgsl_sf_legendre_p2_e (x, result)
- integer(fgsl_int) function fgsl_sf_legendre_p3_e (x, result)
- integer(fgsl_int) function fgsl_sf_legendre_pl_e (l, x, result)
- real(fgsl_double) function fgsl_sf_legendre_pl_array (x, result_array)
- real(fgsl_double) function fgsl_sf_legendre_pl_deriv_array (x, result_array, deriv_array)
- integer(fgsl_int) function fgsl_sf_legendre_q0_e (x, result)
- integer(fgsl_int) function fgsl_sf_legendre_q1_e (x, result)
- integer(fgsl_int) function fgsl_sf_legendre_ql_e (l, x, result)
- integer(fgsl_int) function fgsl_sf_legendre_plm_e (l, m, x, result)
- integer(fgsl_int) function fgsl_sf_legendre_sphplm_e (l, m, x, result)
- integer(fgsl_int) function fgsl_sf_conicalp_half_e (lambda, x, result)
- integer(fgsl_int) function fgsl_sf_conicalp_mhalf_e (lambda, x, result)
- integer(fgsl_int) function fgsl_sf_conicalp_0_e (lambda, x, result)
- integer(fgsl_int) function fgsl_sf_conicalp_1_e (lambda, x, result)
- integer(fgsl_int) function fgsl_sf_conicalp_sph_reg_e (l, lambda, x, result)
- integer(fgsl_int) function fgsl_sf_conicalp_cyl_reg_e (l, lambda, x, result)
- integer(fgsl_int) function fgsl_sf_legendre_h3d_0_e (lambda, eta, result)
- integer(fgsl_int) function fgsl_sf_legendre_h3d_1_e (lambda, eta, result)
- integer(fgsl_int) function fgsl_sf_legendre_h3d_e (l, lambda, eta, result)
- integer(fgsl_int) function fgsl_sf_legendre_h3d_array (lambda, eta, result_array)
- integer(fgsl_int) function fgsl_sf_log_e (x, result)
- integer(fgsl_int) function fgsl_sf_log_abs_e (x, result)
- integer(fgsl_int) function fgsl_sf_complex_log_e (zr, zi, lnr, theta)
- integer(fgsl_int) function fgsl_sf_log_1plusx_e (x, result)
- integer(fgsl_int) function fgsl_sf_log_1plusx_mx_e (x, result)
- integer(fgsl_int) function fgsl_sf_psi_int_e (n, result)

- integer(fgsl_int) function fgsl_sf_psi_e (x, result)
- integer(fgsl_int) function fgsl_sf_psi_1_int_e (n, result)
- integer(fgsl_int) function fgsl_sf_psi_1_e (x, result)
- integer(fgsl_int) function fgsl_sf_psi_n_e (m, x, result)
- integer(fgsl_int) function fgsl_sf_psi_1piy_e (x, result)
- integer(fgsl_int) function fgsl_sf_synchrotron_1_e (x, result)
- integer(fgsl_int) function fgsl_sf_synchrotron_2_e (x, result)
- integer(fgsl_int) function fgsl_sf_transport_2_e (x, result)
- integer(fgsl_int) function fgsl_sf_transport_3_e (x, result)
- integer(fgsl_int) function fgsl_sf_transport_4_e (x, result)
- integer(fgsl_int) function fgsl_sf_transport_5_e (x, result)
- integer(fgsl_int) function fgsl_sf_hypot_e (x, y, result)
- integer(fgsl_int) function fgsl_sf_sinc_e (x, result)
- integer(fgsl_int) function fgsl_sf_complex_sin_e (zr, zi, szr, szi)
- integer(fgsl_int) function fgsl_sf_complex_cos_e (zr, zi, czr, czi)
- integer(fgsl_int) function fgsl_sf_complex_logsin_e (zr, zi, lszr, lszi)
- integer(fgsl_int) function fgsl_sf_lnsinh_e (x, result)
- integer(fgsl_int) function fgsl_sf_lncosh_e (x, result)
- integer(fgsl_int) function fgsl_sf_polar_to_rect (r, theta, x, y)
- integer(fgsl_int) function fgsl_sf_rect_to_polar (x, y, r, theta)
- integer(fgsl_int) function fgsl_sf_angle_restrict_symm_e (theta)
- integer(fgsl_int) function fgsl_sf_angle_restrict_pos_e (theta)
- integer(fgsl_int) function fgsl_sf_sin_err_e (x, dx, result)
- integer(fgsl_int) function fgsl_sf_cos_err_e (x, dx, result)
- integer(fgsl_int) function fgsl_sf_zeta_int_e (n, result)
- integer(fgsl_int) function fgsl_sf_zeta_e (x, result)
- integer(fgsl_int) function fgsl_sf_zetam1_int_e (n, result)
- integer(fgsl_int) function fgsl_sf_zetam1_e (x, result)
- integer(fgsl_int) function fgsl_sf_hzeta_e (s, q, result)
- integer(fgsl_int) function fgsl_sf_eta_int_e (n, result)
- integer(fgsl_int) function fgsl_sf_eta_e (x, result)
- elemental subroutine gsl_sf_to_fgsl_sf (result, source)
- elemental subroutine gsl_sfe10_to_fgsl_sfe10 (result, source)
- integer(fgsl_int) function fgsl_sf_legendre_array (norm, lmax, x, result_array)
- integer(fgsl_int) function fgsl_sf_legendre_array_e (norm, lmax, x, csphase, result_array)
- integer(fgsl_int) function fgsl_sf_legendre_deriv_array (norm, lmax, x, result_array, result_deriv_array)
- integer(fgsl_int) function fgsl_sf_legendre_deriv_array_e (norm, lmax, x, csphase, result_array, result_deriv↩ _array)
- integer(fgsl_int) function fgsl_sf_legendre_deriv_alt_array (norm, lmax, x, result_array, result_deriv_array)
- integer(fgsl_int) function fgsl_sf_legendre_deriv_alt_array_e (norm, lmax, x, csphase, result_array, result_↩ deriv_array)
- integer(fgsl_int) function fgsl_sf_legendre_deriv2_array (norm, lmax, x, result_array, result_deriv_array, result_deriv2_array)
- integer(fgsl_int) function fgsl_sf_legendre_deriv2_array_e (norm, lmax, x, csphase, result_array, result_↩ deriv_array, result_deriv2_array)
- integer(fgsl_int) function fgsl_sf_legendre_deriv2_alt_array (norm, lmax, x, result_array, result_deriv_array, result_deriv2_array)
- integer(fgsl_int) function fgsl_sf_legendre_deriv2_alt_array_e (norm, lmax, x, csphase, result_array, result↩ _deriv_array, result_deriv2_array)
- integer(fgsl_int) function fgsl_sf_mathieu_a_array (order_min, order_max, qq, work, result_array)
- integer(fgsl_int) function fgsl_sf_mathieu_b_array (order_min, order_max, qq, work, result_array)
- integer(fgsl_int) function fgsl_sf_mathieu_a_e (order, qq, result)
- integer(fgsl_int) function fgsl_sf_mathieu_b_e (order, qq, result)
- type(fgsl_sf_mathieu_workspace) function fgsl_sf_mathieu_alloc (nn, qq)
- subroutine fgsl_sf_mathieu_free (workspace)

- integer(fgsl_int) function fgsl_sf_mathieu_ce_e (order, qq, zz, result)
- integer(fgsl_int) function fgsl_sf_mathieu_se_e (order, qq, zz, result)
- integer(fgsl_int) function fgsl_sf_mathieu_ce_array (nmin, nmax, qq, zz, work, result_array)
- integer(fgsl_int) function fgsl_sf_mathieu_se_array (nmin, nmax, qq, zz, work, result_array)
- integer(fgsl_int) function fgsl_sf_mathieu_mc_e (kind, order, qq, zz, result)
- integer(fgsl_int) function fgsl_sf_mathieu_ms_e (kind, order, qq, zz, result)
- integer(fgsl_int) function fgsl_sf_mathieu_mc_array (kind, nmin, nmax, qq, zz, work, result_array)
- integer(fgsl_int) function fgsl_sf_mathieu_ms_array (kind, nmin, nmax, qq, zz, work, result_array)

49.37.1 Function/Subroutine Documentation

49.37.1.1 fgsl_sf_airy_ai()

```
real(fgsl_double) function fgsl_sf_airy_ai (
             real(fgsl_double), intent(in) x,
             type(fgsl_mode_t), intent(in) mode )
```

49.37.1.2 fgsl_sf_airy_ai_deriv()

```
real(fgsl_double) function fgsl_sf_airy_ai_deriv (
             real(fgsl_double), intent(in) x,
             type(fgsl_mode_t), intent(in) mode )
```

49.37.1.3 fgsl_sf_airy_ai_deriv_e()

```
integer(fgsl_int) function fgsl_sf_airy_ai_deriv_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_mode_t), intent(in) mode,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.4 fgsl_sf_airy_ai_deriv_scaled()

```
real(fgsl_double) function fgsl_sf_airy_ai_deriv_scaled (
             real(fgsl_double), intent(in) x,
             type(fgsl_mode_t), intent(in) mode )
```

49.37.1.5 fgsl_sf_airy_ai_deriv_scaled_e()

```
integer(fgsl_int) function fgsl_sf_airy_ai_deriv_scaled_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_mode_t), intent(in) mode,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.6 fgsl_sf_airy_ai_e()

```
integer(fgsl_int) function fgsl_sf_airy_ai_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_mode_t), intent(in) mode,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.7 fgsl_sf_airy_ai_scaled()

```
real(fgsl_double) function fgsl_sf_airy_ai_scaled (
             real(fgsl_double), intent(in) x,
             type(fgsl_mode_t), intent(in) mode )
```

49.37.1.8 fgsl_sf_airy_ai_scaled_e()

```
integer(fgsl_int) function fgsl_sf_airy_ai_scaled_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_mode_t), intent(in) mode,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.9 fgsl_sf_airy_bi()

```
real(fgsl_double) function fgsl_sf_airy_bi (
             real(fgsl_double), intent(in) x,
             type(fgsl_mode_t), intent(in) mode )
```

49.37.1.10 fgsl_sf_airy_bi_deriv()

```
real(fgsl_double) function fgsl_sf_airy_bi_deriv (
             real(fgsl_double), intent(in) x,
             type(fgsl_mode_t), intent(in) mode )
```

49.37.1.11 fgsl_sf_airy_bi_deriv_e()

```
integer(fgsl_int) function fgsl_sf_airy_bi_deriv_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_mode_t), intent(in) mode,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.12 fgsl_sf_airy_bi_deriv_scaled()

```
real(fgsl_double) function fgsl_sf_airy_bi_deriv_scaled (
             real(fgsl_double), intent(in) x,
             type(fgsl_mode_t), intent(in) mode )
```

49.37.1.13 fgsl_sf_airy_bi_deriv_scaled_e()

```
integer(fgsl_int) function fgsl_sf_airy_bi_deriv_scaled_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_mode_t), intent(in) mode,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.14 fgsl_sf_airy_bi_e()

```
integer(fgsl_int) function fgsl_sf_airy_bi_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_mode_t), intent(in) mode,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.15 fgsl_sf_airy_bi_scaled()

```
real(fgsl_double) function fgsl_sf_airy_bi_scaled (
             real(fgsl_double), intent(in) x,
             type(fgsl_mode_t), intent(in) mode )
```

49.37.1.16 fgsl_sf_airy_bi_scaled_e()

```
integer(fgsl_int) function fgsl_sf_airy_bi_scaled_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_mode_t), intent(in) mode,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.17 fgsl_sf_airy_zero_ai()

```
real(fgsl_double) function fgsl_sf_airy_zero_ai (
             integer(fgsl_int), intent(in) s )
```

49.37.1.18 fgsl_sf_airy_zero_ai_deriv()

```
real(fgsl_double) function fgsl_sf_airy_zero_ai_deriv (
             integer(fgsl_int), intent(in) s )
```

49.37.1.19 fgsl_sf_airy_zero_ai_deriv_e()

```
integer(fgsl_int) function fgsl_sf_airy_zero_ai_deriv_e (
             integer(fgsl_int), intent(in) s,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.20 fgsl_sf_airy_zero_ai_e()

```
integer(fgsl_int) function fgsl_sf_airy_zero_ai_e (
             integer(fgsl_int), intent(in) s,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.21 fgsl_sf_airy_zero_bi()

```
real(fgsl_double) function fgsl_sf_airy_zero_bi (
             integer(fgsl_int), intent(in) s )
```

49.37.1.22 fgsl_sf_airy_zero_bi_deriv()

```
real(fgsl_double) function fgsl_sf_airy_zero_bi_deriv (
             integer(fgsl_int), intent(in) s )
```

49.37.1.23 fgsl_sf_airy_zero_bi_deriv_e()

```
integer(fgsl_int) function fgsl_sf_airy_zero_bi_deriv_e (
             integer(fgsl_int), intent(in) s,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.24 fgsl_sf_airy_zero_bi_e()

```
integer(fgsl_int) function fgsl_sf_airy_zero_bi_e (
             integer(fgsl_int), intent(in) s,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.25 fgsl_sf_angle_restrict_pos_e()

```
integer(fgsl_int) function fgsl_sf_angle_restrict_pos_e (
             real(fgsl_double), intent(inout) theta )
```

49.37.1.26 fgsl_sf_angle_restrict_symm_e()

```
integer(fgsl_int) function fgsl_sf_angle_restrict_symm_e (
             real(fgsl_double), intent(inout) theta )
```

49.37.1.27 fgsl_sf_atanint_e()

```
integer(fgsl_int) function fgsl_sf_atanint_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.28 fgsl_sf_bessel_ic0_e()

```
integer(fgsl_int) function fgsl_sf_bessel_ic0_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.29 fgsl_sf_bessel_ic0_scaled_e()

```
integer(fgsl_int) function fgsl_sf_bessel_ic0_scaled_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.30 fgsl_sf_bessel_ic1_e()

```
integer(fgsl_int) function fgsl_sf_bessel_ic1_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.31 fgsl_sf_bessel_ic1_scaled_e()

```
integer(fgsl_int) function fgsl_sf_bessel_ic1_scaled_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.32 fgsl_sf_bessel_icn_e()

```
integer(fgsl_int) function fgsl_sf_bessel_icn_e (
             integer(fgsl_int), intent(in) n,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.33 fgsl_sf_bessel_icn_scaled_e()

```
integer(fgsl_int) function fgsl_sf_bessel_icn_scaled_e (
             integer(fgsl_int), intent(in) n,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.34 fgsl_sf_bessel_inu_e()

```
integer(fgsl_int) function fgsl_sf_bessel_inu_e (
             real(fgsl_double), intent(in) n,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.35 fgsl_sf_bessel_inu_scaled_e()

```
integer(fgsl_int) function fgsl_sf_bessel_inu_scaled_e (
             real(fgsl_double), intent(in) n,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.36 fgsl_sf_bessel_is0_scaled_e()

```
integer(fgsl_int) function fgsl_sf_bessel_is0_scaled_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.37 fgsl_sf_bessel_is1_scaled_e()

```
integer(fgsl_int) function fgsl_sf_bessel_is1_scaled_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.38 fgsl_sf_bessel_is2_scaled_e()

```
integer(fgsl_int) function fgsl_sf_bessel_is2_scaled_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.39 fgsl_sf_bessel_isl_scaled_e()

```
integer(fgsl_int) function fgsl_sf_bessel_isl_scaled_e (
             integer(fgsl_int), intent(in) n,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.40 fgsl_sf_bessel_jc0_e()

```
integer(fgsl_int) function fgsl_sf_bessel_jc0_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.41 fgsl_sf_bessel_jc1_e()

```
integer(fgsl_int) function fgsl_sf_bessel_jc1_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.42 fgsl_sf_bessel_jcn_e()

```
integer(fgsl_int) function fgsl_sf_bessel_jcn_e (
             integer(fgsl_int), intent(in) n,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.43 fgsl_sf_bessel_jnu_e()

```
integer(fgsl_int) function fgsl_sf_bessel_jnu_e (
             real(fgsl_double), intent(in) n,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.44 fgsl_sf_bessel_js0_e()

```
integer(fgsl_int) function fgsl_sf_bessel_js0_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.45 fgsl_sf_bessel_js1_e()

```
integer(fgsl_int) function fgsl_sf_bessel_js1_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.46 fgsl_sf_bessel_js2_e()

```
integer(fgsl_int) function fgsl_sf_bessel_js2_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.47 fgsl_sf_bessel_jsl_e()

```
integer(fgsl_int) function fgsl_sf_bessel_jsl_e (
             integer(fgsl_int), intent(in) n,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.48 fgsl_sf_bessel_kc0_e()

```
integer(fgsl_int) function fgsl_sf_bessel_kc0_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.49 fgsl_sf_bessel_kc0_scaled_e()

```
integer(fgsl_int) function fgsl_sf_bessel_kc0_scaled_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.50 fgsl_sf_bessel_kc1_e()

```
integer(fgsl_int) function fgsl_sf_bessel_kc1_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.51 fgsl_sf_bessel_kc1_scaled_e()

```
integer(fgsl_int) function fgsl_sf_bessel_kc1_scaled_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.52 fgsl_sf_bessel_kcn_e()

```
integer(fgsl_int) function fgsl_sf_bessel_kcn_e (
             integer(fgsl_int), intent(in) n,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.53 fgsl_sf_bessel_kcn_scaled_e()

```
integer(fgsl_int) function fgsl_sf_bessel_kcn_scaled_e (
             integer(fgsl_int), intent(in) n,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.54 fgsl_sf_bessel_knu_e()

```
integer(fgsl_int) function fgsl_sf_bessel_knu_e (
             real(fgsl_double), intent(in) n,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.55 fgsl_sf_bessel_knu_scaled_e()

```
integer(fgsl_int) function fgsl_sf_bessel_knu_scaled_e (
             real(fgsl_double), intent(in) n,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.56 fgsl_sf_bessel_ks0_scaled_e()

```
integer(fgsl_int) function fgsl_sf_bessel_ks0_scaled_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.57 fgsl_sf_bessel_ks1_scaled_e()

```
integer(fgsl_int) function fgsl_sf_bessel_ks1_scaled_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.58 fgsl_sf_bessel_ks2_scaled_e()

```
integer(fgsl_int) function fgsl_sf_bessel_ks2_scaled_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.59 fgsl_sf_bessel_ksl_scaled_e()

```
integer(fgsl_int) function fgsl_sf_bessel_ksl_scaled_e (
             integer(fgsl_int), intent(in) n,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.60 fgsl_sf_bessel_lnknu_e()

```
integer(fgsl_int) function fgsl_sf_bessel_lnknu_e (
             real(fgsl_double), intent(in) n,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.61 fgsl_sf_bessel_sequence_jnu_e()

```
integer(fgsl_int) function fgsl_sf_bessel_sequence_jnu_e (
             real(fgsl_double), intent(in) nu,
             type(fgsl_mode_t), intent(in) mode,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous v )
```

49.37.1.62 fgsl_sf_bessel_yc0_e()

```
integer(fgsl_int) function fgsl_sf_bessel_yc0_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.63 fgsl_sf_bessel_yc1_e()

```
integer(fgsl_int) function fgsl_sf_bessel_yc1_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.64 fgsl_sf_bessel_ycn_e()

```
integer(fgsl_int) function fgsl_sf_bessel_ycn_e (
             integer(fgsl_int), intent(in) n,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.65 fgsl_sf_bessel_ynu_e()

```
integer(fgsl_int) function fgsl_sf_bessel_ynu_e (
             real(fgsl_double), intent(in) n,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.66 fgsl_sf_bessel_ys0_e()

```
integer(fgsl_int) function fgsl_sf_bessel_ys0_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.67 fgsl_sf_bessel_ys1_e()

```
integer(fgsl_int) function fgsl_sf_bessel_ys1_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.68 fgsl_sf_bessel_ys2_e()

```
integer(fgsl_int) function fgsl_sf_bessel_ys2_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.69 fgsl_sf_bessel_ysl_e()

```
integer(fgsl_int) function fgsl_sf_bessel_ysl_e (
             integer(fgsl_int), intent(in) n,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.70 fgsl_sf_bessel_zero_jc0_e()

```
integer(fgsl_int) function fgsl_sf_bessel_zero_jc0_e (
             integer(fgsl_int), intent(in) s,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.71 fgsl_sf_bessel_zero_jc1_e()

```
integer(fgsl_int) function fgsl_sf_bessel_zero_jc1_e (
             integer(fgsl_int), intent(in) s,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.72 fgsl_sf_bessel_zero_jnu_e()

```
integer(fgsl_int) function fgsl_sf_bessel_zero_jnu_e (
             real(fgsl_double), intent(in) nu,
             integer(fgsl_int), intent(in) s,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.73 fgsl_sf_beta_e()

```
integer(fgsl_int) function fgsl_sf_beta_e (
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.74 fgsl_sf_beta_inc_e()

```
integer(fgsl_int) function fgsl_sf_beta_inc_e (
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.75 fgsl_sf_chi_e()

```
integer(fgsl_int) function fgsl_sf_chi_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.76 fgsl_sf_choose_e()

```
integer(fgsl_int) function fgsl_sf_choose_e (
             integer(c_int), intent(in) n,
             integer(c_int), intent(in) m,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.77 fgsl_sf_ci_e()

```
integer(fgsl_int) function fgsl_sf_ci_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.78 fgsl_sf_clausen_e()

```
integer(fgsl_int) function fgsl_sf_clausen_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.79 fgsl_sf_complex_cos_e()

```
integer(fgsl_int) function fgsl_sf_complex_cos_e (
             real(fgsl_double), intent(in) zr,
             real(fgsl_double), intent(in) zi,
             type(fgsl_sf_result), intent(out) czr,
             type(fgsl_sf_result), intent(out) czi )
```

49.37.1.80 fgsl_sf_complex_dilog_e()

```
integer(fgsl_int) function fgsl_sf_complex_dilog_e (
             real(fgsl_double), intent(in) r,
             real(fgsl_double), intent(in) theta,
             type(fgsl_sf_result), intent(out) result_re,
             type(fgsl_sf_result), intent(out) result_im )
```

49.37.1.81 fgsl_sf_complex_log_e()

```
integer(fgsl_int) function fgsl_sf_complex_log_e (
             real(fgsl_double), intent(in) zr,
             real(fgsl_double), intent(in) zi,
             type(fgsl_sf_result), intent(out) lnr,
             type(fgsl_sf_result), intent(out) theta )
```

49.37.1.82 fgsl_sf_complex_logsin_e()

```
integer(fgsl_int) function fgsl_sf_complex_logsin_e (
             real(fgsl_double), intent(in) zr,
             real(fgsl_double), intent(in) zi,
             type(fgsl_sf_result), intent(out) lszr,
             type(fgsl_sf_result), intent(out) lszi )
```

49.37.1.83 fgsl_sf_complex_sin_e()

```
integer(fgsl_int) function fgsl_sf_complex_sin_e (
             real(fgsl_double), intent(in) zr,
             real(fgsl_double), intent(in) zi,
             type(fgsl_sf_result), intent(out) szr,
             type(fgsl_sf_result), intent(out) szi )
```

49.37.1.84 fgsl_sf_conicalp_0_e()

```
integer(fgsl_int) function fgsl_sf_conicalp_0_e (
             real(fgsl_double), intent(in) lambda,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.85 fgsl_sf_conicalp_1_e()

```
integer(fgsl_int) function fgsl_sf_conicalp_1_e (
             real(fgsl_double), intent(in) lambda,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.86 fgsl_sf_conicalp_cyl_reg_e()

```
integer(fgsl_int) function fgsl_sf_conicalp_cyl_reg_e (
             integer(fgsl_int), intent(in) l,
             real(fgsl_double), intent(in) lambda,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.87 fgsl_sf_conicalp_half_e()

```
integer(fgsl_int) function fgsl_sf_conicalp_half_e (
             real(fgsl_double), intent(in) lambda,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.88 fgsl_sf_conicalp_mhalf_e()

```
integer(fgsl_int) function fgsl_sf_conicalp_mhalf_e (
             real(fgsl_double), intent(in) lambda,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.89 fgsl_sf_conicalp_sph_reg_e()

```
integer(fgsl_int) function fgsl_sf_conicalp_sph_reg_e (
             integer(fgsl_int), intent(in) l,
             real(fgsl_double), intent(in) lambda,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.90 fgsl_sf_cos_err_e()

```
integer(fgsl_int) function fgsl_sf_cos_err_e (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) dx,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.91 fgsl_sf_coulomb_cl_array()

```
integer(fgsl_int) function fgsl_sf_coulomb_cl_array (
             real(fgsl_double), intent(in) l_min,
             real(fgsl_double), intent(in) eta,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous cl )
```

49.37.1.92 fgsl_sf_coulomb_cl_e()

```
integer(fgsl_int) function fgsl_sf_coulomb_cl_e (
             real(fgsl_double), intent(in) l,
             real(fgsl_double), intent(in) eta,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.93 fgsl_sf_coulomb_wave_f_array()

```
integer(fgsl_int) function fgsl_sf_coulomb_wave_f_array (
             real(fgsl_double), intent(in) l_min,
             real(fgsl_double), intent(in) eta,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous fc_array,
             real(fgsl_double), intent(out) f_exponent )
```

49.37.1.94 fgsl_sf_coulomb_wave_fg_array()

```
integer(fgsl_int) function fgsl_sf_coulomb_wave_fg_array (
             real(fgsl_double), intent(in) l_min,
             real(fgsl_double), intent(in) eta,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), dimension(:), intent(out), target, contiguous fc_array,
             real(fgsl_double), dimension(:), intent(out), target, contiguous gc_array,
             real(fgsl_double), intent(out) f_exponent,
             real(fgsl_double), intent(out) g_exponent )
```

49.37.1.95 fgsl_sf_coulomb_wave_fg_e()

```
integer(fgsl_int) function fgsl_sf_coulomb_wave_fg_e (
             real(fgsl_double), intent(in) eta,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) l_f,
             integer(fgsl_int), intent(in) k,
             type(fgsl_sf_result), intent(out) f,
             type(fgsl_sf_result), intent(out) fp,
             type(fgsl_sf_result), intent(out) g,
             type(fgsl_sf_result), intent(out) gp,
             real(fgsl_double), intent(out) exp_f,
             real(fgsl_double), intent(out) exp_g )
```

49.37.1.96 fgsl_sf_coulomb_wave_fgp_array()

```
integer(fgsl_int) function fgsl_sf_coulomb_wave_fgp_array (
             real(fgsl_double), intent(in) l_min,
             real(fgsl_double), intent(in) eta,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous fc_array,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous fcp_array,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous gc_array,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous gcp_array,
             real(fgsl_double), intent(out) f_exponent,
             real(fgsl_double), intent(out) g_exponent )
```

49.37.1.97 fgsl_sf_coulomb_wave_sphf_array()

```
integer(fgsl_int) function fgsl_sf_coulomb_wave_sphf_array (
             real(fgsl_double), intent(in) l_min,
             real(fgsl_double), intent(in) eta,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous fc_array,
             real(fgsl_double), intent(out) f_exponent )
```

49.37.1.98 fgsl_sf_coupling_3j_e()

```
integer(fgsl_int) function fgsl_sf_coupling_3j_e (
             integer(fgsl_int), intent(in) two_ja,
             integer(fgsl_int), intent(in) two_jb,
             integer(fgsl_int), intent(in) two_jc,
             integer(fgsl_int), intent(in) two_ma,
             integer(fgsl_int), intent(in) two_mb,
             integer(fgsl_int), intent(in) two_mc,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.99 fgsl_sf_coupling_6j_e()

```
integer(fgsl_int) function fgsl_sf_coupling_6j_e (
             integer(fgsl_int), intent(in) two_ja,
             integer(fgsl_int), intent(in) two_jb,
             integer(fgsl_int), intent(in) two_jc,
             integer(fgsl_int), intent(in) two_jd,
             integer(fgsl_int), intent(in) two_je,
             integer(fgsl_int), intent(in) two_jf,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.100 fgsl_sf_coupling_9j_e()

```
integer(fgsl_int) function fgsl_sf_coupling_9j_e (
             integer(fgsl_int), intent(in) two_ja,
             integer(fgsl_int), intent(in) two_jb,
             integer(fgsl_int), intent(in) two_jc,
             integer(fgsl_int), intent(in) two_jd,
             integer(fgsl_int), intent(in) two_je,
             integer(fgsl_int), intent(in) two_jf,
             integer(fgsl_int), intent(in) two_jg,
             integer(fgsl_int), intent(in) two_jh,
             integer(fgsl_int), intent(in) two_ji,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.101 fgsl_sf_dawson_e()

```
integer(fgsl_int) function fgsl_sf_dawson_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.102 fgsl_sf_debye_1_e()

```
integer(fgsl_int) function fgsl_sf_debye_1_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.103 fgsl_sf_debye_2_e()

```
integer(fgsl_int) function fgsl_sf_debye_2_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.104 fgsl_sf_debye_3_e()

```
integer(fgsl_int) function fgsl_sf_debye_3_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.105 fgsl_sf_debye_4_e()

```
integer(fgsl_int) function fgsl_sf_debye_4_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.106 fgsl_sf_debye_5_e()

```
integer(fgsl_int) function fgsl_sf_debye_5_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.107 fgsl_sf_debye_6_e()

```
integer(fgsl_int) function fgsl_sf_debye_6_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.108 fgsl_sf_dilog_e()

```
integer(fgsl_int) function fgsl_sf_dilog_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.109 fgsl_sf_doublefact_e()

```
integer(fgsl_int) function fgsl_sf_doublefact_e (
             integer(c_int), intent(in) n,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.110 fgsl_sf_ellint_d()

```
real(fgsl_double) function fgsl_sf_ellint_d (
             real(fgsl_double), intent(in) phi,
             real(fgsl_double), intent(in) k,
             type(fgsl_mode_t), intent(in) mode )
```

49.37.1.111 fgsl_sf_ellint_d_e()

```
integer(fgsl_int) function fgsl_sf_ellint_d_e (
             real(fgsl_double), intent(in) phi,
             real(fgsl_double), intent(in) k,
             type(fgsl_mode_t), intent(in) mode,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.112 fgsl_sf_ellint_e()

```
real(fgsl_double) function fgsl_sf_ellint_e (
             real(fgsl_double), intent(in) phi,
             real(fgsl_double), intent(in) k,
             type(fgsl_mode_t), intent(in) mode )
```

49.37.1.113 fgsl_sf_ellint_e_e()

```
integer(fgsl_int) function fgsl_sf_ellint_e_e (
             real(fgsl_double), intent(in) phi,
             real(fgsl_double), intent(in) k,
             type(fgsl_mode_t), intent(in) mode,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.114 fgsl_sf_ellint_ecomp()

```
real(fgsl_double) function fgsl_sf_ellint_ecomp (
             real(fgsl_double), intent(in) k,
             type(fgsl_mode_t), intent(in) mode )
```

49.37.1.115 fgsl_sf_ellint_ecomp_e()

```
integer(fgsl_int) function fgsl_sf_ellint_ecomp_e (
             real(fgsl_double), intent(in) k,
             type(fgsl_mode_t), intent(in) mode,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.116 fgsl_sf_ellint_f()

```
real(fgsl_double) function fgsl_sf_ellint_f (
             real(fgsl_double), intent(in) phi,
             real(fgsl_double), intent(in) k,
             type(fgsl_mode_t), intent(in) mode )
```

49.37.1.117 fgsl_sf_ellint_f_e()

```
integer(fgsl_int) function fgsl_sf_ellint_f_e (
             real(fgsl_double), intent(in) phi,
             real(fgsl_double), intent(in) k,
             type(fgsl_mode_t), intent(in) mode,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.118 fgsl_sf_ellint_kcomp()

```
real(fgsl_double) function fgsl_sf_ellint_kcomp (
             real(fgsl_double), intent(in) k,
             type(fgsl_mode_t), intent(in) mode )
```

49.37.1.119 fgsl_sf_ellint_kcomp_e()

```
integer(fgsl_int) function fgsl_sf_ellint_kcomp_e (
             real(fgsl_double), intent(in) k,
             type(fgsl_mode_t), intent(in) mode,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.120 fgsl_sf_ellint_p()

```
real(fgsl_double) function fgsl_sf_ellint_p (
             real(fgsl_double), intent(in) phi,
             real(fgsl_double), intent(in) k,
             real(fgsl_double), intent(in) n,
             type(fgsl_mode_t), intent(in) mode )
```

49.37.1.121 fgsl_sf_ellint_p_e()

```
integer(fgsl_int) function fgsl_sf_ellint_p_e (
             real(fgsl_double), intent(in) phi,
             real(fgsl_double), intent(in) k,
             real(fgsl_double), intent(in) n,
             type(fgsl_mode_t), intent(in) mode,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.122 fgsl_sf_ellint_pcomp()

```
real(fgsl_double) function fgsl_sf_ellint_pcomp (
             real(fgsl_double), intent(in) k,
             real(fgsl_double), intent(in) n,
             type(fgsl_mode_t), intent(in) mode )
```

49.37.1.123 fgsl_sf_ellint_pcomp_e()

```
integer(fgsl_int) function fgsl_sf_ellint_pcomp_e (
             real(fgsl_double), intent(in) k,
             real(fgsl_double), intent(in) n,
             type(fgsl_mode_t), intent(in) mode,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.124 fgsl_sf_ellint_rc()

```
real(fgsl_double) function fgsl_sf_ellint_rc (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             type(fgsl_mode_t), intent(in) mode )
```

49.37.1.125 fgsl_sf_ellint_rc_e()

```
integer(fgsl_int) function fgsl_sf_ellint_rc_e (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             type(fgsl_mode_t), intent(in) mode,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.126 fgsl_sf_ellint_rd()

```
real(fgsl_double) function fgsl_sf_ellint_rd (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             real(fgsl_double), intent(in) z,
             type(fgsl_mode_t), intent(in) mode )
```

49.37.1.127 fgsl_sf_ellint_rd_e()

```
integer(fgsl_int) function fgsl_sf_ellint_rd_e (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             real(fgsl_double), intent(in) z,
             type(fgsl_mode_t), intent(in) mode,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.128 fgsl_sf_ellint_rf()

```
real(fgsl_double) function fgsl_sf_ellint_rf (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             real(fgsl_double), intent(in) z,
             type(fgsl_mode_t), intent(in) mode )
```

49.37.1.129 fgsl_sf_ellint_rf_e()

```
integer(fgsl_int) function fgsl_sf_ellint_rf_e (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             real(fgsl_double), intent(in) z,
             type(fgsl_mode_t), intent(in) mode,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.130 fgsl_sf_ellint_rj()

```
real(fgsl_double) function fgsl_sf_ellint_rj (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             real(fgsl_double), intent(in) z,
             real(fgsl_double), intent(in) p,
             type(fgsl_mode_t), intent(in) mode )
```

49.37.1.131 fgsl_sf_ellint_rj_e()

```
integer(fgsl_int) function fgsl_sf_ellint_rj_e (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             real(fgsl_double), intent(in) z,
             real(fgsl_double), intent(in) p,
             type(fgsl_mode_t), intent(in) mode,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.132 fgsl_sf_erf_e()

```
integer(fgsl_int) function fgsl_sf_erf_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.133 fgsl_sf_erf_q_e()

```
integer(fgsl_int) function fgsl_sf_erf_q_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.134 fgsl_sf_erf_z_e()

```
integer(fgsl_int) function fgsl_sf_erf_z_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.135 fgsl_sf_erfc_e()

```
integer(fgsl_int) function fgsl_sf_erfc_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.136 fgsl_sf_eta_e()

```
integer(fgsl_int) function fgsl_sf_eta_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.137 fgsl_sf_eta_int_e()

```
integer(fgsl_int) function fgsl_sf_eta_int_e (
             integer(c_int), intent(in) n,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.138 fgsl_sf_exp_e()

```
integer(fgsl_int) function fgsl_sf_exp_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.139 fgsl_sf_exp_e10_e()

```
integer(fgsl_int) function fgsl_sf_exp_e10_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result_e10), intent(out) result )
```

49.37.1.140 fgsl_sf_exp_err_e()

```
integer(fgsl_int) function fgsl_sf_exp_err_e (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) dx,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.141 fgsl_sf_exp_err_e10_e()

```
integer(fgsl_int) function fgsl_sf_exp_err_e10_e (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) dx,
             type(fgsl_sf_result_e10), intent(out) result )
```

49.37.1.142 fgsl_sf_exp_mult_e()

```
integer(fgsl_int) function fgsl_sf_exp_mult_e (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.143 fgsl_sf_exp_mult_e10_e()

```
integer(fgsl_int) function fgsl_sf_exp_mult_e10_e (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             type(fgsl_sf_result_e10), intent(out) result )
```

49.37.1.144 fgsl_sf_exp_mult_err_e()

```
integer(fgsl_int) function fgsl_sf_exp_mult_err_e (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) dx,
             real(fgsl_double), intent(in) y,
             real(fgsl_double), intent(in) dy,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.145 fgsl_sf_exp_mult_err_e10_e()

```
integer(fgsl_int) function fgsl_sf_exp_mult_err_e10_e (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) dx,
             real(fgsl_double), intent(in) y,
             real(fgsl_double), intent(in) dy,
             type(fgsl_sf_result_e10), intent(out) result )
```

49.37.1.146 fgsl_sf_expint_3_e()

```
integer(fgsl_int) function fgsl_sf_expint_3_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.147 fgsl_sf_expint_e1_e()

```
integer(fgsl_int) function fgsl_sf_expint_e1_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.148 fgsl_sf_expint_e2_e()

```
integer(fgsl_int) function fgsl_sf_expint_e2_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.149 fgsl_sf_expint_ei_e()

```
integer(fgsl_int) function fgsl_sf_expint_ei_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.150 fgsl_sf_expint_en_e()

```
integer(fgsl_int) function fgsl_sf_expint_en_e (
             integer(fgsl_int), intent(in) n,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.151 fgsl_sf_expm1_e()

```
integer(fgsl_int) function fgsl_sf_expm1_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.152 fgsl_sf_exprel_2_e()

```
integer(fgsl_int) function fgsl_sf_exprel_2_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.153 fgsl_sf_exprel_e()

```
integer(fgsl_int) function fgsl_sf_exprel_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.154 fgsl_sf_exprel_n_e()

```
integer(fgsl_int) function fgsl_sf_exprel_n_e (
             integer(fgsl_int), intent(in) n,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.155 fgsl_sf_fact_e()

```
integer(fgsl_int) function fgsl_sf_fact_e (
             integer(c_int), intent(in) n,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.156 fgsl_sf_fermi_dirac_0_e()

```
integer(fgsl_int) function fgsl_sf_fermi_dirac_0_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.157 fgsl_sf_fermi_dirac_1_e()

```
integer(fgsl_int) function fgsl_sf_fermi_dirac_1_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.158 fgsl_sf_fermi_dirac_2_e()

```
integer(fgsl_int) function fgsl_sf_fermi_dirac_2_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.159 fgsl_sf_fermi_dirac_3half_e()

```
integer(fgsl_int) function fgsl_sf_fermi_dirac_3half_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.160 fgsl_sf_fermi_dirac_half_e()

```
integer(fgsl_int) function fgsl_sf_fermi_dirac_half_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.161 fgsl_sf_fermi_dirac_inc_0_e()

```
integer(fgsl_int) function fgsl_sf_fermi_dirac_inc_0_e (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) b,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.162 fgsl_sf_fermi_dirac_int_e()

```
integer(fgsl_int) function fgsl_sf_fermi_dirac_int_e (
             integer(fgsl_int), intent(in) i,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.163 fgsl_sf_fermi_dirac_m1_e()

```
integer(fgsl_int) function fgsl_sf_fermi_dirac_m1_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.164 fgsl_sf_fermi_dirac_mhalf_e()

```
integer(fgsl_int) function fgsl_sf_fermi_dirac_mhalf_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.165 fgsl_sf_gamma_e()

```
integer(fgsl_int) function fgsl_sf_gamma_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.166 fgsl_sf_gamma_inc_e()

```
integer(fgsl_int) function fgsl_sf_gamma_inc_e (
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.167 fgsl_sf_gamma_inc_p_e()

```
integer(fgsl_int) function fgsl_sf_gamma_inc_p_e (
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.168 fgsl_sf_gamma_inc_q_e()

```
integer(fgsl_int) function fgsl_sf_gamma_inc_q_e (
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.169 fgsl_sf_gammainv_e()

```
integer(fgsl_int) function fgsl_sf_gammainv_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.170 fgsl_sf_gammastar_e()

```
integer(fgsl_int) function fgsl_sf_gammastar_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.171 fgsl_sf_gegenpoly_1_e()

```
integer(fgsl_int) function fgsl_sf_gegenpoly_1_e (
             real(fgsl_double), intent(in) lambda,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.172 fgsl_sf_gegenpoly_2_e()

```
integer(fgsl_int) function fgsl_sf_gegenpoly_2_e (
             real(fgsl_double), intent(in) lambda,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.173 fgsl_sf_gegenpoly_3_e()

```
integer(fgsl_int) function fgsl_sf_gegenpoly_3_e (
             real(fgsl_double), intent(in) lambda,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.174 fgsl_sf_gegenpoly_array()

```
integer(fgsl_int) function fgsl_sf_gegenpoly_array (
             real(fgsl_double), intent(in) lambda,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous result_array )
```

49.37.1.175 fgsl_sf_gegenpoly_n_e()

```
integer(fgsl_int) function fgsl_sf_gegenpoly_n_e (
             integer(fgsl_int), intent(in) n,
             real(fgsl_double), intent(in) lambda,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.176 fgsl_sf_hazard_e()

```
integer(fgsl_int) function fgsl_sf_hazard_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.177 fgsl_sf_hermite_func_e()

```
integer(fgsl_int) function fgsl_sf_hermite_func_e (
             integer(fgsl_int), intent(in) n,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.178 fgsl_sf_hermite_func_series_e()

```
integer(fgsl_int) function fgsl_sf_hermite_func_series_e (
             integer(fgsl_int), intent(in) n,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), dimension(*), intent(in) a,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.179 fgsl_sf_hermite_phys_e()

```
integer(fgsl_int) function fgsl_sf_hermite_phys_e (
             integer(fgsl_int), intent(in) n,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.180 fgsl_sf_hermite_phys_series_e()

```
integer(fgsl_int) function fgsl_sf_hermite_phys_series_e (
             integer(fgsl_int), intent(in) n,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), dimension(*), intent(in) a,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.181 fgsl_sf_hermite_prob_e()

```
integer(fgsl_int) function fgsl_sf_hermite_prob_e (
             integer(fgsl_int), intent(in) n,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.182 fgsl_sf_hermite_prob_series_e()

```
integer(fgsl_int) function fgsl_sf_hermite_prob_series_e (
             integer(fgsl_int), intent(in) n,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), dimension(*), intent(in) a,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.183 fgsl_sf_hydrogenicr_1_e()

```
integer(fgsl_int) function fgsl_sf_hydrogenicr_1_e (
             real(fgsl_double), intent(in) z,
             real(fgsl_double), intent(in) r,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.184 fgsl_sf_hydrogenicr_e()

```
integer(fgsl_int) function fgsl_sf_hydrogenicr_e (
             integer(fgsl_int), intent(in) n,
             integer(fgsl_int), intent(in) l,
             real(fgsl_double), intent(in) z,
             real(fgsl_double), intent(in) r,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.185 fgsl_sf_hyperg_0f1_e()

```
integer(fgsl_int) function fgsl_sf_hyperg_0f1_e (
             real(fgsl_double), intent(in) c,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.186 fgsl_sf_hyperg_1f1_e()

```
integer(fgsl_int) function fgsl_sf_hyperg_1f1_e (
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.187 fgsl_sf_hyperg_1f1_int_e()

```
integer(fgsl_int) function fgsl_sf_hyperg_1f1_int_e (
             integer(fgsl_int), intent(in) m,
             integer(fgsl_int), intent(in) n,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.188 fgsl_sf_hyperg_2f0_e()

```
integer(fgsl_int) function fgsl_sf_hyperg_2f0_e (
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.189 fgsl_sf_hyperg_2f1_conj_e()

```
integer(fgsl_int) function fgsl_sf_hyperg_2f1_conj_e (
             real(fgsl_double), intent(in) ar,
             real(fgsl_double), intent(in) ai,
             real(fgsl_double), intent(in) c,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.190 fgsl_sf_hyperg_2f1_conj_renorm_e()

```
integer(fgsl_int) function fgsl_sf_hyperg_2f1_conj_renorm_e (
             real(fgsl_double), intent(in) ar,
             real(fgsl_double), intent(in) ai,
             real(fgsl_double), intent(in) c,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.191 fgsl_sf_hyperg_2f1_e()

```
integer(fgsl_int) function fgsl_sf_hyperg_2f1_e (
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b,
             real(fgsl_double), intent(in) c,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.192 fgsl_sf_hyperg_2f1_renorm_e()

```
integer(fgsl_int) function fgsl_sf_hyperg_2f1_renorm_e (
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b,
             real(fgsl_double), intent(in) c,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.193 fgsl_sf_hyperg_u_e()

```
integer(fgsl_int) function fgsl_sf_hyperg_u_e (
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.194 fgsl_sf_hyperg_u_e10_e()

```
integer(fgsl_int) function fgsl_sf_hyperg_u_e10_e (
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result_e10), intent(out) result )
```

49.37.1.195 fgsl_sf_hyperg_u_int_e()

```
integer(fgsl_int) function fgsl_sf_hyperg_u_int_e (
             integer(fgsl_int), intent(in) m,
             integer(fgsl_int), intent(in) n,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.196 fgsl_sf_hyperg_u_int_e10_e()

```
integer(fgsl_int) function fgsl_sf_hyperg_u_int_e10_e (
             integer(fgsl_int), intent(in) m,
             integer(fgsl_int), intent(in) n,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result_e10), intent(out) result )
```

49.37.1.197 fgsl_sf_hypot_e()

```
integer(fgsl_int) function fgsl_sf_hypot_e (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.198 fgsl_sf_hzeta_e()

```
integer(fgsl_int) function fgsl_sf_hzeta_e (
             real(fgsl_double), intent(in) s,
             real(fgsl_double), intent(in) q,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.199 fgsl_sf_laguerre_1_e()

```
integer(fgsl_int) function fgsl_sf_laguerre_1_e (
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.200 fgsl_sf_laguerre_2_e()

```
integer(fgsl_int) function fgsl_sf_laguerre_2_e (
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.201 fgsl_sf_laguerre_3_e()

```
integer(fgsl_int) function fgsl_sf_laguerre_3_e (
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.202 fgsl_sf_laguerre_n_e()

```
integer(fgsl_int) function fgsl_sf_laguerre_n_e (
             integer(fgsl_int), intent(in) n,
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.203 fgsl_sf_lambert_w0_e()

```
integer(fgsl_int) function fgsl_sf_lambert_w0_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.204 fgsl_sf_lambert_wm1_e()

```
integer(fgsl_int) function fgsl_sf_lambert_wm1_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.205 fgsl_sf_legendre_array()

```
integer(fgsl_int) function fgsl_sf_legendre_array (
             type(fgsl_sf_legendre_t), intent(in) norm,
             integer(fgsl_size_t), intent(in) lmax,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous result_array )
```

49.37.1.206 fgsl_sf_legendre_array_e()

```
integer(fgsl_int) function fgsl_sf_legendre_array_e (
             type(fgsl_sf_legendre_t), intent(in) norm,
             integer(fgsl_size_t), intent(in) lmax,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) csphase,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous result_array )
```

49.37.1.207 fgsl_sf_legendre_deriv2_alt_array()

```
integer(fgsl_int) function fgsl_sf_legendre_deriv2_alt_array (
             type(fgsl_sf_legendre_t), intent(in) norm,
             integer(fgsl_size_t), intent(in) lmax,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous result_array,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous result_deriv_↩
array,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous result_deriv2↩
_array )
```

49.37.1.208 fgsl_sf_legendre_deriv2_alt_array_e()

```
integer(fgsl_int) function fgsl_sf_legendre_deriv2_alt_array_e (
             type(fgsl_sf_legendre_t), intent(in) norm,
             integer(fgsl_size_t), intent(in) lmax,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) csphase,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous result_array,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous result_deriv_↩
array,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous result_deriv2↩
_array )
```

49.37.1.209 fgsl_sf_legendre_deriv2_array()

```
integer(fgsl_int) function fgsl_sf_legendre_deriv2_array (
             type(fgsl_sf_legendre_t), intent(in) norm,
             integer(fgsl_size_t), intent(in) lmax,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous result_array,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous result_deriv_↩
array,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous result_deriv2↩
_array )
```

49.37.1.210 fgsl_sf_legendre_deriv2_array_e()

```
integer(fgsl_int) function fgsl_sf_legendre_deriv2_array_e (
             type(fgsl_sf_legendre_t), intent(in) norm,
             integer(fgsl_size_t), intent(in) lmax,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) csphase,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous result_array,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous result_deriv_↩
array,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous result_deriv2↩
_array )
```

49.37.1.211 fgsl_sf_legendre_deriv_alt_array()

```
integer(fgsl_int) function fgsl_sf_legendre_deriv_alt_array (
             type(fgsl_sf_legendre_t), intent(in) norm,
             integer(fgsl_size_t), intent(in) lmax,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous result_array,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous result_deriv_↩
array )
```

49.37.1.212 fgsl_sf_legendre_deriv_alt_array_e()

```
integer(fgsl_int) function fgsl_sf_legendre_deriv_alt_array_e (
             type(fgsl_sf_legendre_t), intent(in) norm,
             integer(fgsl_size_t), intent(in) lmax,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) csphase,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous result_array,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous result_deriv_↩
array )
```

49.37.1.213 fgsl_sf_legendre_deriv_array()

```
integer(fgsl_int) function fgsl_sf_legendre_deriv_array (
             type(fgsl_sf_legendre_t), intent(in) norm,
             integer(fgsl_size_t), intent(in) lmax,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous result_array,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous result_deriv_↩
array )
```

49.37.1.214 fgsl_sf_legendre_deriv_array_e()

```
integer(fgsl_int) function fgsl_sf_legendre_deriv_array_e (
             type(fgsl_sf_legendre_t), intent(in) norm,
             integer(fgsl_size_t), intent(in) lmax,
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) csphase,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous result_array,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous result_deriv_↩
array )
```

49.37.1.215 fgsl_sf_legendre_h3d_0_e()

```
integer(fgsl_int) function fgsl_sf_legendre_h3d_0_e (
             real(fgsl_double), intent(in) lambda,
             real(fgsl_double), intent(in) eta,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.216 fgsl_sf_legendre_h3d_1_e()

```
integer(fgsl_int) function fgsl_sf_legendre_h3d_1_e (
             real(fgsl_double), intent(in) lambda,
             real(fgsl_double), intent(in) eta,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.217 fgsl_sf_legendre_h3d_array()

```
integer(fgsl_int) function fgsl_sf_legendre_h3d_array (
             real(fgsl_double), intent(in) lambda,
             real(fgsl_double), intent(in) eta,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous result_array )
```

49.37.1.218 fgsl_sf_legendre_h3d_e()

```
integer(fgsl_int) function fgsl_sf_legendre_h3d_e (
             integer(fgsl_int), intent(in) l,
             real(fgsl_double), intent(in) lambda,
             real(fgsl_double), intent(in) eta,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.219 fgsl_sf_legendre_p1_e()

```
integer(fgsl_int) function fgsl_sf_legendre_p1_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.220 fgsl_sf_legendre_p2_e()

```
integer(fgsl_int) function fgsl_sf_legendre_p2_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.221 fgsl_sf_legendre_p3_e()

```
integer(fgsl_int) function fgsl_sf_legendre_p3_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.222 fgsl_sf_legendre_pl_array()

```
real(fgsl_double) function fgsl_sf_legendre_pl_array (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous result_array )
```

49.37.1.223 fgsl_sf_legendre_pl_deriv_array()

```
real(fgsl_double) function fgsl_sf_legendre_pl_deriv_array (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous result_array,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous deriv_array )
```

49.37.1.224 fgsl_sf_legendre_pl_e()

```
integer(fgsl_int) function fgsl_sf_legendre_pl_e (
             integer(fgsl_int), intent(in) l,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.225 fgsl_sf_legendre_plm_e()

```
integer(fgsl_int) function fgsl_sf_legendre_plm_e (
             integer(fgsl_int), intent(in) l,
             integer(fgsl_int), intent(in) m,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.226 fgsl_sf_legendre_q0_e()

```
integer(fgsl_int) function fgsl_sf_legendre_q0_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.227 fgsl_sf_legendre_q1_e()

```
integer(fgsl_int) function fgsl_sf_legendre_q1_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.228 fgsl_sf_legendre_ql_e()

```
integer(fgsl_int) function fgsl_sf_legendre_ql_e (
             integer(fgsl_int), intent(in) l,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.229 fgsl_sf_legendre_sphplm_e()

```
integer(fgsl_int) function fgsl_sf_legendre_sphplm_e (
             integer(fgsl_int), intent(in) l,
             integer(fgsl_int), intent(in) m,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.230 fgsl_sf_lnbeta_e()

```
integer(fgsl_int) function fgsl_sf_lnbeta_e (
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) b,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.231 fgsl_sf_lnchoose_e()

```
integer(fgsl_int) function fgsl_sf_lnchoose_e (
             integer(c_int), intent(in) n,
             integer(c_int), intent(in) m,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.232 fgsl_sf_lncosh_e()

```
integer(fgsl_int) function fgsl_sf_lncosh_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.233 fgsl_sf_lndoublefact_e()

```
integer(fgsl_int) function fgsl_sf_lndoublefact_e (
             integer(c_int), intent(in) n,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.234 fgsl_sf_lnfact_e()

```
integer(fgsl_int) function fgsl_sf_lnfact_e (
             integer(c_int), intent(in) n,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.235 fgsl_sf_lngamma_complex_e()

```
integer(fgsl_int) function fgsl_sf_lngamma_complex_e (
             real(fgsl_double), intent(in) zr,
             real(fgsl_double), intent(in) zi,
             type(fgsl_sf_result), intent(out) lnr,
             type(fgsl_sf_result), intent(out) arg )
```

49.37.1.236 fgsl_sf_lngamma_e()

```
integer(fgsl_int) function fgsl_sf_lngamma_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.237 fgsl_sf_lngamma_sgn_e()

```
integer(fgsl_int) function fgsl_sf_lngamma_sgn_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result_lg,
             real(fgsl_double), intent(out) sgn )
```

49.37.1.238 fgsl_sf_lnpoch_e()

```
integer(fgsl_int) function fgsl_sf_lnpoch_e (
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.239 fgsl_sf_lnpoch_sgn_e()

```
integer(fgsl_int) function fgsl_sf_lnpoch_sgn_e (
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result_lg,
             real(fgsl_double), intent(out) sgn )
```

49.37.1.240 fgsl_sf_lnsinh_e()

```
integer(fgsl_int) function fgsl_sf_lnsinh_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.241 fgsl_sf_log_1plusx_e()

```
integer(fgsl_int) function fgsl_sf_log_1plusx_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.242 fgsl_sf_log_1plusx_mx_e()

```
integer(fgsl_int) function fgsl_sf_log_1plusx_mx_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.243 fgsl_sf_log_abs_e()

```
integer(fgsl_int) function fgsl_sf_log_abs_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.244 fgsl_sf_log_e()

```
integer(fgsl_int) function fgsl_sf_log_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.245 fgsl_sf_log_erfc_e()

```
integer(fgsl_int) function fgsl_sf_log_erfc_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.246 fgsl_sf_mathieu_a_array()

```
integer(fgsl_int) function fgsl_sf_mathieu_a_array (
             integer(fgsl_int), intent(in) order_min,
             integer(fgsl_int), intent(in) order_max,
             real(fgsl_double), intent(in) qq,
             type(fgsl_sf_mathieu_workspace), intent(inout) work,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous result_array )
```

49.37.1.247 fgsl_sf_mathieu_a_e()

```
integer(fgsl_int) function fgsl_sf_mathieu_a_e (
             integer(c_int), intent(in) order,
             real(c_double), intent(in) qq,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.248 fgsl_sf_mathieu_alloc()

```
type(fgsl_sf_mathieu_workspace) function fgsl_sf_mathieu_alloc (
             integer(fgsl_size_t), intent(in) nn,
             real(fgsl_double), intent(in) qq )
```

49.37.1.249 fgsl_sf_mathieu_b_array()

```
integer(fgsl_int) function fgsl_sf_mathieu_b_array (
             integer(fgsl_int), intent(in) order_min,
             integer(fgsl_int), intent(in) order_max,
             real(fgsl_double), intent(in) qq,
             type(fgsl_sf_mathieu_workspace), intent(inout) work,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous result_array )
```

49.37.1.250 fgsl_sf_mathieu_b_e()

```
integer(fgsl_int) function fgsl_sf_mathieu_b_e (
             integer(c_int), intent(in) order,
             real(c_double), intent(in) qq,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.251 fgsl_sf_mathieu_ce_array()

```
integer(fgsl_int) function fgsl_sf_mathieu_ce_array (
             integer(fgsl_int), intent(in) nmin,
             integer(fgsl_int), intent(in) nmax,
             real(fgsl_double), intent(in) qq,
             real(fgsl_double), intent(in) zz,
             type(fgsl_sf_mathieu_workspace), intent(inout) work,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous result_array )
```

49.37.1.252 fgsl_sf_mathieu_ce_e()

```
integer(fgsl_int) function fgsl_sf_mathieu_ce_e (
             integer(fgsl_int), intent(in) order,
             real(fgsl_double), intent(in) qq,
             real(fgsl_double), intent(in) zz,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.253 fgsl_sf_mathieu_free()

```
subroutine fgsl_sf_mathieu_free (
             type(fgsl_sf_mathieu_workspace), intent(inout) workspace )
```

49.37.1.254 fgsl_sf_mathieu_mc_array()

```
integer(fgsl_int) function fgsl_sf_mathieu_mc_array (
             integer(fgsl_int), intent(in) kind,
             integer(fgsl_int), intent(in) nmin,
             integer(fgsl_int), intent(in) nmax,
             real(fgsl_double), intent(in) qq,
             real(fgsl_double), intent(in) zz,
             type(fgsl_sf_mathieu_workspace), intent(inout) work,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous result_array )
```

49.37.1.255 fgsl_sf_mathieu_mc_e()

```
integer(fgsl_int) function fgsl_sf_mathieu_mc_e (
             integer(fgsl_int), intent(in) kind,
             integer(fgsl_int), intent(in) order,
             real(fgsl_double), intent(in) qq,
             real(fgsl_double), intent(in) zz,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.256 fgsl_sf_mathieu_ms_array()

```
integer(fgsl_int) function fgsl_sf_mathieu_ms_array (
             integer(fgsl_int), intent(in) kind,
             integer(fgsl_int), intent(in) nmin,
             integer(fgsl_int), intent(in) nmax,
             real(fgsl_double), intent(in) qq,
             real(fgsl_double), intent(in) zz,
             type(fgsl_sf_mathieu_workspace), intent(inout) work,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous result_array )
```

49.37.1.257 fgsl_sf_mathieu_ms_e()

```
integer(fgsl_int) function fgsl_sf_mathieu_ms_e (
             integer(fgsl_int), intent(in) kind,
             integer(fgsl_int), intent(in) order,
             real(fgsl_double), intent(in) qq,
             real(fgsl_double), intent(in) zz,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.258 fgsl_sf_mathieu_se_array()

```
integer(fgsl_int) function fgsl_sf_mathieu_se_array (
             integer(fgsl_int), intent(in) nmin,
             integer(fgsl_int), intent(in) nmax,
             real(fgsl_double), intent(in) qq,
             real(fgsl_double), intent(in) zz,
             type(fgsl_sf_mathieu_workspace), intent(inout) work,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous result_array )
```

49.37.1.259 fgsl_sf_mathieu_se_e()

```
integer(fgsl_int) function fgsl_sf_mathieu_se_e (
             integer(fgsl_int), intent(in) order,
             real(fgsl_double), intent(in) qq,
             real(fgsl_double), intent(in) zz,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.260 fgsl_sf_multiply_e()

```
integer(fgsl_int) function fgsl_sf_multiply_e (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.261 fgsl_sf_multiply_err_e()

```
integer(fgsl_int) function fgsl_sf_multiply_err_e (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) dx,
             real(fgsl_double), intent(in) y,
             real(fgsl_double), intent(in) dy,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.262 fgsl_sf_poch_e()

```
integer(fgsl_int) function fgsl_sf_poch_e (
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.263 fgsl_sf_pochrel_e()

```
integer(fgsl_int) function fgsl_sf_pochrel_e (
             real(fgsl_double), intent(in) a,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.264 fgsl_sf_polar_to_rect()

```
integer(fgsl_int) function fgsl_sf_polar_to_rect (
             real(fgsl_double), intent(in) r,
             real(fgsl_double), intent(in) theta,
             type(fgsl_sf_result), intent(out) x,
             type(fgsl_sf_result), intent(out) y )
```

49.37.1.265 fgsl_sf_psi_1_e()

```
integer(fgsl_int) function fgsl_sf_psi_1_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.266 fgsl_sf_psi_1_int_e()

```
integer(fgsl_int) function fgsl_sf_psi_1_int_e (
             integer(c_int), intent(in) n,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.267 fgsl_sf_psi_1piy_e()

```
integer(fgsl_int) function fgsl_sf_psi_1piy_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.268 fgsl_sf_psi_e()

```
integer(fgsl_int) function fgsl_sf_psi_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.269 fgsl_sf_psi_int_e()

```
integer(fgsl_int) function fgsl_sf_psi_int_e (
             integer(c_int), intent(in) n,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.270 fgsl_sf_psi_n_e()

```
integer(fgsl_int) function fgsl_sf_psi_n_e (
             integer(fgsl_int), intent(in) m,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.271 fgsl_sf_rect_to_polar()

```
integer(fgsl_int) function fgsl_sf_rect_to_polar (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) y,
             type(fgsl_sf_result), intent(out) r,
             type(fgsl_sf_result), intent(out) theta )
```

49.37.1.272 fgsl_sf_shi_e()

```
integer(fgsl_int) function fgsl_sf_shi_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.273 fgsl_sf_si_e()

```
integer(fgsl_int) function fgsl_sf_si_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.274 fgsl_sf_sin_err_e()

```
integer(fgsl_int) function fgsl_sf_sin_err_e (
             real(fgsl_double), intent(in) x,
             real(fgsl_double), intent(in) dx,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.275 fgsl_sf_sinc_e()

```
integer(fgsl_int) function fgsl_sf_sinc_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.276 fgsl_sf_synchrotron_1_e()

```
integer(fgsl_int) function fgsl_sf_synchrotron_1_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.277 fgsl_sf_synchrotron_2_e()

```
integer(fgsl_int) function fgsl_sf_synchrotron_2_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.278 fgsl_sf_taylorcoeff_e()

```
integer(fgsl_int) function fgsl_sf_taylorcoeff_e (
             integer(fgsl_int), intent(in) n,
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.279 fgsl_sf_transport_2_e()

```
integer(fgsl_int) function fgsl_sf_transport_2_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.280 fgsl_sf_transport_3_e()

```
integer(fgsl_int) function fgsl_sf_transport_3_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.281 fgsl_sf_transport_4_e()

```
integer(fgsl_int) function fgsl_sf_transport_4_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.282 fgsl_sf_transport_5_e()

```
integer(fgsl_int) function fgsl_sf_transport_5_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.283 fgsl_sf_zeta_e()

```
integer(fgsl_int) function fgsl_sf_zeta_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.284 fgsl_sf_zeta_int_e()

```
integer(fgsl_int) function fgsl_sf_zeta_int_e (
             integer(c_int), intent(in) n,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.285 fgsl_sf_zetam1_e()

```
integer(fgsl_int) function fgsl_sf_zetam1_e (
             real(fgsl_double), intent(in) x,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.286 fgsl_sf_zetam1_int_e()

```
integer(fgsl_int) function fgsl_sf_zetam1_int_e (
             integer(c_int), intent(in) n,
             type(fgsl_sf_result), intent(out) result )
```

49.37.1.287 gsl_sf_to_fgsl_sf()

```
elemental subroutine gsl_sf_to_fgsl_sf (
             type(fgsl_sf_result), intent(out) result,
             type(gsl_sf_result), intent(in) source )
```

49.37.1.288 gsl_sfe10_to_fgsl_sfe10()

```
elemental subroutine gsl_sfe10_to_fgsl_sfe10 (
             type(fgsl_sf_result_e10), intent(out) result,
             type(gsl_sf_result_e10), intent(in) source )
```

49.38 api/splinalg.finc File Reference

Functions/Subroutines

- type(fgsl_splinalg_itersolve) function fgsl_splinalg_itersolve_alloc (T, n, m)
- subroutine fgsl_splinalg_itersolve_free (w)
- character(kind=fgsl_char, len=fgsl_strmax) function fgsl_splinalg_itersolve_name (w)
- integer(fgsl_int) function fgsl_splinalg_itersolve_iterate (A, b, tol, x, w)
- real(fgsl_double) function fgsl_splinalg_itersolve_normr (w)

49.38.1 Function/Subroutine Documentation

49.38.1.1 fgsl_splinalg_itersolve_alloc()

```
type(fgsl_splinalg_itersolve) function fgsl_splinalg_itersolve_alloc (
             type(fgsl_splinalg_itersolve_type), intent(in) T,
             integer(fgsl_size_t), intent(in) n,
             integer(fgsl_size_t), intent(in) m )
```

49.38.1.2 fgsl_splinalg_itersolve_free()

```
subroutine fgsl_splinalg_itersolve_free (
             type(fgsl_splinalg_itersolve), intent(inout) w )
```

49.38.1.3 fgsl_splinalg_itersolve_iterate()

```
integer(fgsl_int) function fgsl_splinalg_itersolve_iterate (
             type(fgsl_spmatrix), intent(in) A,
             type(fgsl_vector), intent(in) b,
             real(fgsl_double), intent(in) tol,
             type(fgsl_vector), intent(inout) x,
             type(fgsl_splinalg_itersolve), intent(inout) w )
```

49.38.1.4 fgsl_splinalg_itersolve_name()

```
character(kind=fgsl_char,len=fgsl_strmax) function fgsl_splinalg_itersolve_name (
             type(fgsl_splinalg_itersolve), intent(in) w )
```

49.38.1.5 fgsl_splinalg_itersolve_normr()

```
real(fgsl_double) function fgsl_splinalg_itersolve_normr (
             type(fgsl_splinalg_itersolve), intent(in) w )
```

49.39 api/spmatrix.finc File Reference

Functions/Subroutines

- type(fgsl_spmatrix) function fgsl_spmatrix_alloc (n1, n2)
- type(fgsl_spmatrix) function fgsl_spmatrix_alloc_nzmax (n1, n2, nzmax, flags)
- subroutine fgsl_spmatrix_size (m, n1, n2)
- subroutine fgsl_spmatrix_free (m)
- integer(fgsl_int) function fgsl_spmatrix_realloc (nzmax, m)
- integer(fgsl_int) function fgsl_spmatrix_set_zero (m)
- integer(fgsl_size_t) function fgsl_spmatrix_nnz (m)
- integer(fgsl_int) function fgsl_spmatrix_compare_idx (ia, ja, ib, jb)
- integer(fgsl_int) function fgsl_spmatrix_memcpy (dest, src)
- real(fgsl_double) function fgsl_spmatrix_get (m, i, j)
- integer(fgsl_int) function fgsl_spmatrix_set (m, i, j, x)
- type(fgsl_spmatrix) function fgsl_spmatrix_compcol (T)
- subroutine fgsl_spmatrix_cumsum (n, c)
- integer(fgsl_int) function fgsl_spmatrix_scale (m, x)
- integer(fgsl_int) function fgsl_spmatrix_minmax (m, min_out, max_out)
- integer(fgsl_int) function fgsl_spmatrix_add (c, a, b)
- integer(fgsl_int) function fgsl_spmatrix_d2sp (S, A)
- integer(fgsl_int) function fgsl_spmatrix_sp2d (A, S)
- integer(fgsl_int) function fgsl_spmatrix_equal (a, b)
- integer(fgsl_int) function fgsl_spmatrix_transpose_memcpy (dest, src)
- integer(fgsl_int) function fgsl_spblas_dgemv (transa, alpha, a, x, beta, y)
- integer(fgsl_int) function fgsl_spblas_dgemm (alpha, a, b, c)

49.39.1 Function/Subroutine Documentation

49.39.1.1 fgsl_spblas_dgemm()

```
integer(fgsl_int) function fgsl_spblas_dgemm (
             real(fgsl_double), intent(in) alpha,
             type(fgsl_spmatrix), intent(in) a,
             type(fgsl_spmatrix), intent(in) b,
             type(fgsl_spmatrix), intent(inout) c )
```

49.39.1.2 fgsl_spblas_dgemv()

```
integer(fgsl_int) function fgsl_spblas_dgemv (
             integer(fgsl_int), intent(in) transa,
             real(fgsl_double), intent(in) alpha,
             type(fgsl_spmatrix), intent(in) a,
             type(fgsl_vector), intent(in) x,
             real(fgsl_double), intent(in) beta,
             type(fgsl_vector), intent(inout) y )
```

49.39.1.3 fgsl_spmatrix_add()

```
integer(fgsl_int) function fgsl_spmatrix_add (
             type(fgsl_spmatrix), intent(inout) c,
             type(fgsl_spmatrix), intent(in) a,
             type(fgsl_spmatrix), intent(in) b )
```

49.39.1.4 fgsl_spmatrix_alloc()

```
type(fgsl_spmatrix) function fgsl_spmatrix_alloc (
             integer(fgsl_size_t), intent(in) n1,
             integer(fgsl_size_t), intent(in) n2 )
```

49.39.1.5 fgsl_spmatrix_alloc_nzmax()

```
type(fgsl_spmatrix) function fgsl_spmatrix_alloc_nzmax (
             integer(fgsl_size_t), intent(in) n1,
             integer(fgsl_size_t), intent(in) n2,
             integer(fgsl_size_t), intent(in) nzmax,
             integer(fgsl_size_t), intent(in) flags )
```

49.39.1.6 fgsl_spmatrix_compare_idx()

```
integer(fgsl_int) function fgsl_spmatrix_compare_idx (
             integer(fgsl_size_t), intent(in) ia,
             integer(fgsl_size_t), intent(in) ja,
             integer(fgsl_size_t), intent(in) ib,
             integer(fgsl_size_t), intent(in) jb )
```

49.39.1.7 fgsl_spmatrix_compcol()

```
type(fgsl_spmatrix) function fgsl_spmatrix_compcol (
             type(fgsl_spmatrix), intent(in) T )
```

49.39.1.8 fgsl_spmatrix_cumsum()

```
subroutine fgsl_spmatrix_cumsum (
             integer(fgsl_size_t), intent(in) n,
             integer(fgsl_size_t), dimension(:), intent(inout), target, contiguous c )
```

49.39.1.9 fgsl_spmatrix_d2sp()

```
integer(fgsl_int) function fgsl_spmatrix_d2sp (
             type(fgsl_spmatrix), intent(inout) S,
             type(fgsl_matrix), intent(in) A )
```

49.39.1.10 fgsl_spmatrix_equal()

```
integer(fgsl_int) function fgsl_spmatrix_equal (
             type(fgsl_spmatrix), intent(in) a,
             type(fgsl_spmatrix), intent(in) b )
```

49.39.1.11 fgsl_spmatrix_free()

```
subroutine fgsl_spmatrix_free (
             type(fgsl_spmatrix), intent(in) m )
```

49.39.1.12 fgsl_spmatrix_get()

```
real(fgsl_double) function fgsl_spmatrix_get (
             type(fgsl_spmatrix), intent(in) m,
             integer(fgsl_size_t), intent(in) i,
             integer(fgsl_size_t), intent(in) j )
```

49.39.1.13 fgsl_spmatrix_memcpy()

```
integer(fgsl_int) function fgsl_spmatrix_memcpy (
             type(fgsl_spmatrix), intent(inout) dest,
             type(fgsl_spmatrix), intent(in) src )
```

49.39.1.14 fgsl_spmatrix_minmax()

```
integer(fgsl_int) function fgsl_spmatrix_minmax (
             type(fgsl_spmatrix), intent(in) m,
             real(fgsl_double), intent(out) min_out,
             real(fgsl_double), intent(out) max_out )
```

49.39.1.15 fgsl_spmatrix_nnz()

```
integer(fgsl_size_t) function fgsl_spmatrix_nnz (
             type(fgsl_spmatrix), intent(in) m )
```

49.39.1.16 fgsl_spmatrix_realloc()

```
integer(fgsl_int) function fgsl_spmatrix_realloc (
             integer(fgsl_size_t), intent(in) nzmax,
             type(fgsl_spmatrix), intent(inout) m )
```

49.39.1.17 fgsl_spmatrix_scale()

```
integer(fgsl_int) function fgsl_spmatrix_scale (
             type(fgsl_spmatrix), intent(inout) m,
             real(fgsl_double), intent(in) x )
```

49.39.1.18 fgsl_spmatrix_set()

```
integer(fgsl_int) function fgsl_spmatrix_set (
             type(fgsl_spmatrix), intent(in) m,
             integer(fgsl_size_t), intent(in) i,
             integer(fgsl_size_t), intent(in) j,
             real(fgsl_double), intent(in) x )
```

49.39.1.19 fgsl_spmatrix_set_zero()

```
integer(fgsl_int) function fgsl_spmatrix_set_zero (
             type(fgsl_spmatrix), intent(inout) m )
```

49.39.1.20 fgsl_spmatrix_size()

```
subroutine fgsl_spmatrix_size (
             type(fgsl_spmatrix), intent(in) m,
             integer(fgsl_size_t), intent(inout) n1,
             integer(fgsl_size_t), intent(inout) n2 )
```

49.39.1.21 fgsl_spmatrix_sp2d()

```
integer(fgsl_int) function fgsl_spmatrix_sp2d (
             type(fgsl_matrix), intent(inout) A,
             type(fgsl_spmatrix), intent(in) S )
```

49.39.1.22 fgsl_spmatrix_transpose_memcpy()

```
integer(fgsl_int) function fgsl_spmatrix_transpose_memcpy (
             type(fgsl_spmatrix), intent(inout) dest,
             type(fgsl_spmatrix), intent(in) src )
```

49.40 api/statistics.finc File Reference

Functions/Subroutines

- real(fgsl_double) function fgsl_stats_mean (data, stride, n)
- real(fgsl_double) function fgsl_stats_variance (data, stride, n)
- real(fgsl_double) function fgsl_stats_variance_m (data, stride, n, mean)
- real(fgsl_double) function fgsl_stats_sd (data, stride, n)
- real(fgsl_double) function fgsl_stats_sd_m (data, stride, n, mean)
- real(fgsl_double) function fgsl_stats_variance_with_fixed_mean (data, stride, n, mean)
- real(fgsl_double) function fgsl_stats_sd_with_fixed_mean (data, stride, n, mean)
- real(fgsl_double) function fgsl_stats_absdev (data, stride, n)
- real(fgsl_double) function fgsl_stats_absdev_m (data, stride, n, mean)
- real(fgsl_double) function fgsl_stats_skew (data, stride, n)
- real(fgsl_double) function fgsl_stats_skew_m_sd (data, stride, n, mean, sd)
- real(fgsl_double) function fgsl_stats_kurtosis (data, stride, n)
- real(fgsl_double) function fgsl_stats_kurtosis_m_sd (data, stride, n, mean, sd)
- real(fgsl_double) function fgsl_stats_lag1_autocorrelation (data, stride, n)
- real(fgsl_double) function fgsl_stats_lag1_autocorrelation_m (data, stride, n, mean)
- real(fgsl_double) function fgsl_stats_covariance (data1, stride1, data2, stride2, n)
- real(fgsl_double) function fgsl_stats_covariance_m (data1, stride1, data2, stride2, n, mean1, mean2)
- real(fgsl_double) function fgsl_stats_correlation (data1, stride1, data2, stride2, n)
- real(fgsl_double) function fgsl_stats_spearman (data1, stride1, data2, stride2, n, work)
- real(fgsl_double) function fgsl_stats_wmean (w, wstride, data, stride, n)
- real(fgsl_double) function fgsl_stats_wvariance (w, wstride, data, stride, n)
- real(fgsl_double) function fgsl_stats_wvariance_m (w, wstride, data, stride, n, mean)
- real(fgsl_double) function fgsl_stats_wsd (w, wstride, data, stride, n)
- real(fgsl_double) function fgsl_stats_wsd_m (w, wstride, data, stride, n, mean)
- real(fgsl_double) function fgsl_stats_wvariance_with_fixed_mean (w, wstride, data, stride, n, mean)
- real(fgsl_double) function fgsl_stats_wsd_with_fixed_mean (w, wstride, data, stride, n, mean)
- real(fgsl_double) function fgsl_stats_wabsdev (w, wstride, data, stride, n)
- real(fgsl_double) function fgsl_stats_wabsdev_m (w, wstride, data, stride, n, mean)
- real(fgsl_double) function fgsl_stats_wskew (w, wstride, data, stride, n)
- real(fgsl_double) function fgsl_stats_wskew_m_sd (w, wstride, data, stride, n, mean, sd)
- real(fgsl_double) function fgsl_stats_wkurtosis (w, wstride, data, stride, n)
- real(fgsl_double) function fgsl_stats_wkurtosis_m_sd (w, wstride, data, stride, n, mean, sd)
- real(fgsl_double) function fgsl_stats_max (data, stride, n)

- real(fgsl_double) function fgsl_stats_min (data, stride, n)
- subroutine fgsl_stats_minmax (min, max, data, stride, n)
- integer(fgsl_size_t) function fgsl_stats_max_index (data, stride, n)
- integer(fgsl_size_t) function fgsl_stats_min_index (data, stride, n)
- subroutine fgsl_stats_minmax_index (min_index, max_index, data, stride, n)
- real(fgsl_double) function fgsl_stats_median_from_sorted_data (data, stride, n)
- real(fgsl_double) function fgsl_stats_quantile_from_sorted_data (data, stride, n, f)

49.40.1 Function/Subroutine Documentation

49.40.1.1 fgsl_stats_absdev()

```
real(fgsl_double) function fgsl_stats_absdev (
             real(fgsl_double), dimension(:), intent(in), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.40.1.2 fgsl_stats_absdev_m()

```
real(fgsl_double) function fgsl_stats_absdev_m (
             real(fgsl_double), dimension(:), intent(in), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n,
             real(fgsl_double), intent(in) mean )
```

49.40.1.3 fgsl_stats_correlation()

```
real(fgsl_double) function fgsl_stats_correlation (
             real(fgsl_double), dimension(:), intent(in), target, contiguous data1,
             integer(fgsl_size_t), intent(in) stride1,
             real(fgsl_double), dimension(:), intent(in), target, contiguous data2,
             integer(fgsl_size_t), intent(in) stride2,
             integer(fgsl_size_t), intent(in) n )
```

49.40.1.4 fgsl_stats_covariance()

```
real(fgsl_double) function fgsl_stats_covariance (
             real(fgsl_double), dimension(:), intent(in), target, contiguous data1,
             integer(fgsl_size_t), intent(in) stride1,
             real(fgsl_double), dimension(:), intent(in), target, contiguous data2,
             integer(fgsl_size_t), intent(in) stride2,
             integer(fgsl_size_t), intent(in) n )
```

49.40.1.5 fgsl_stats_covariance_m()

```
real(fgsl_double) function fgsl_stats_covariance_m (
             real(fgsl_double), dimension(:), intent(in), target, contiguous data1,
             integer(fgsl_size_t), intent(in) stride1,
             real(fgsl_double), dimension(:), intent(in), target, contiguous data2,
             integer(fgsl_size_t), intent(in) stride2,
             integer(fgsl_size_t), intent(in) n,
             real(fgsl_double), intent(in) mean1,
             real(fgsl_double), intent(in) mean2 )
```

49.40.1.6 fgsl_stats_kurtosis()

```
real(fgsl_double) function fgsl_stats_kurtosis (
             real(fgsl_double), dimension(:), intent(in), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.40.1.7 fgsl_stats_kurtosis_m_sd()

```
real(fgsl_double) function fgsl_stats_kurtosis_m_sd (
             real(fgsl_double), dimension(:), intent(in), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n,
             real(fgsl_double), intent(in) mean,
             real(fgsl_double), intent(in) sd )
```

49.40.1.8 fgsl_stats_lag1_autocorrelation()

```
real(fgsl_double) function fgsl_stats_lag1_autocorrelation (
             real(fgsl_double), dimension(:), intent(in), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.40.1.9 fgsl_stats_lag1_autocorrelation_m()

```
real(fgsl_double) function fgsl_stats_lag1_autocorrelation_m (
             real(fgsl_double), dimension(:), intent(in), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n,
             real(fgsl_double), intent(in) mean )
```

49.40.1.10 fgsl_stats_max()

```
real(fgsl_double) function fgsl_stats_max (
             real(fgsl_double), dimension(:), intent(in), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.40.1.11 fgsl_stats_max_index()

```
integer(fgsl_size_t) function fgsl_stats_max_index (
             real(fgsl_double), dimension(:), intent(in), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.40.1.12 fgsl_stats_mean()

```
real(fgsl_double) function fgsl_stats_mean (
             real(fgsl_double), dimension(:), intent(in), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.40.1.13 fgsl_stats_median_from_sorted_data()

```
real(fgsl_double) function fgsl_stats_median_from_sorted_data (
             real(fgsl_double), dimension(:), intent(in), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.40.1.14 fgsl_stats_min()

```
real(fgsl_double) function fgsl_stats_min (
             real(fgsl_double), dimension(:), intent(in), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.40.1.15 fgsl_stats_min_index()

```
integer(fgsl_size_t) function fgsl_stats_min_index (
             real(fgsl_double), dimension(:), intent(in), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.40.1.16 fgsl_stats_minmax()

```
subroutine fgsl_stats_minmax (
             real(fgsl_double), intent(out) min,
             real(fgsl_double), intent(out) max,
             real(fgsl_double), dimension(:), intent(in), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.40.1.17 fgsl_stats_minmax_index()

```
subroutine fgsl_stats_minmax_index (
             integer(fgsl_size_t), intent(out) min_index,
             integer(fgsl_size_t), intent(out) max_index,
             real(fgsl_double), dimension(:), intent(in), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.40.1.18 fgsl_stats_quantile_from_sorted_data()

```
real(fgsl_double) function fgsl_stats_quantile_from_sorted_data (
             real(fgsl_double), dimension(:), intent(in), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n,
             real(fgsl_double), intent(in) f )
```

49.40.1.19 fgsl_stats_sd()

```
real(fgsl_double) function fgsl_stats_sd (
             real(fgsl_double), dimension(:), intent(in), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.40.1.20 fgsl_stats_sd_m()

```
real(fgsl_double) function fgsl_stats_sd_m (
             real(fgsl_double), dimension(:), intent(in), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n,
             real(fgsl_double), intent(in) mean )
```

49.40.1.21 fgsl_stats_sd_with_fixed_mean()

```
real(fgsl_double) function fgsl_stats_sd_with_fixed_mean (
             real(fgsl_double), dimension(:), intent(in), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n,
             real(fgsl_double), intent(in) mean )
```

49.40.1.22 fgsl_stats_skew()

```
real(fgsl_double) function fgsl_stats_skew (
             real(fgsl_double), dimension(:), intent(in), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.40.1.23 fgsl_stats_skew_m_sd()

```
real(fgsl_double) function fgsl_stats_skew_m_sd (
             real(fgsl_double), dimension(:), intent(in), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n,
             real(fgsl_double), intent(in) mean,
             real(fgsl_double), intent(in) sd )
```

49.40.1.24 fgsl_stats_spearman()

```
real(fgsl_double) function fgsl_stats_spearman (
             real(fgsl_double), dimension(:), intent(in), target, contiguous data1,
             integer(fgsl_size_t), intent(in) stride1,
             real(fgsl_double), dimension(:), intent(in), target, contiguous data2,
             integer(fgsl_size_t), intent(in) stride2,
             integer(fgsl_size_t), intent(in) n,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous work )
```

49.40.1.25 fgsl_stats_variance()

```
real(fgsl_double) function fgsl_stats_variance (
             real(fgsl_double), dimension(:), intent(in), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.40.1.26 fgsl_stats_variance_m()

```
real(fgsl_double) function fgsl_stats_variance_m (
            real(fgsl_double), dimension(:), intent(in), target, contiguous data,
            integer(fgsl_size_t), intent(in) stride,
            integer(fgsl_size_t), intent(in) n,
            real(fgsl_double), intent(in) mean )
```

49.40.1.27 fgsl_stats_variance_with_fixed_mean()

```
real(fgsl_double) function fgsl_stats_variance_with_fixed_mean (
            real(fgsl_double), dimension(:), intent(in), target, contiguous data,
            integer(fgsl_size_t), intent(in) stride,
            integer(fgsl_size_t), intent(in) n,
            real(fgsl_double), intent(in) mean )
```

49.40.1.28 fgsl_stats_wabsdev()

```
real(fgsl_double) function fgsl_stats_wabsdev (
            real(fgsl_double), dimension(:), intent(in), target, contiguous w,
            integer(fgsl_size_t), intent(in) wstride,
            real(fgsl_double), dimension(:), intent(in), target, contiguous data,
            integer(fgsl_size_t), intent(in) stride,
            integer(fgsl_size_t), intent(in) n )
```

49.40.1.29 fgsl_stats_wabsdev_m()

```
real(fgsl_double) function fgsl_stats_wabsdev_m (
            real(fgsl_double), dimension(:), intent(in), target, contiguous w,
            integer(fgsl_size_t), intent(in) wstride,
            real(fgsl_double), dimension(:), intent(in), target, contiguous data,
            integer(fgsl_size_t), intent(in) stride,
            integer(fgsl_size_t), intent(in) n,
            real(fgsl_double), intent(in) mean )
```

49.40.1.30 fgsl_stats_wkurtosis()

```
real(fgsl_double) function fgsl_stats_wkurtosis (
            real(fgsl_double), dimension(:), intent(in), target, contiguous w,
            integer(fgsl_size_t), intent(in) wstride,
            real(fgsl_double), dimension(:), intent(in), target, contiguous data,
            integer(fgsl_size_t), intent(in) stride,
            integer(fgsl_size_t), intent(in) n )
```

49.40.1.31 fgsl_stats_wkurtosis_m_sd()

```
real(fgsl_double) function fgsl_stats_wkurtosis_m_sd (
             real(fgsl_double), dimension(:), intent(in), target, contiguous w,
             integer(fgsl_size_t), intent(in) wstride,
             real(fgsl_double), dimension(:), intent(in), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n,
             real(fgsl_double), intent(in) mean,
             real(fgsl_double), intent(in) sd )
```

49.40.1.32 fgsl_stats_wmean()

```
real(fgsl_double) function fgsl_stats_wmean (
             real(fgsl_double), dimension(:), intent(in), target, contiguous w,
             integer(fgsl_size_t), intent(in) wstride,
             real(fgsl_double), dimension(:), intent(in), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.40.1.33 fgsl_stats_wsd()

```
real(fgsl_double) function fgsl_stats_wsd (
             real(fgsl_double), dimension(:), intent(in), target, contiguous w,
             integer(fgsl_size_t), intent(in) wstride,
             real(fgsl_double), dimension(:), intent(in), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.40.1.34 fgsl_stats_wsd_m()

```
real(fgsl_double) function fgsl_stats_wsd_m (
             real(fgsl_double), dimension(:), intent(in), target, contiguous w,
             integer(fgsl_size_t), intent(in) wstride,
             real(fgsl_double), dimension(:), intent(in), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n,
             real(fgsl_double), intent(in) mean )
```

49.40.1.35 fgsl_stats_wsd_with_fixed_mean()

```
real(fgsl_double) function fgsl_stats_wsd_with_fixed_mean (
             real(fgsl_double), dimension(:), intent(in), target, contiguous w,
             integer(fgsl_size_t), intent(in) wstride,
             real(fgsl_double), dimension(:), intent(in), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n,
             real(fgsl_double), intent(in) mean )
```

49.40.1.36 fgsl_stats_wskew()

```
real(fgsl_double) function fgsl_stats_wskew (
             real(fgsl_double), dimension(:), intent(in), target, contiguous w,
             integer(fgsl_size_t), intent(in) wstride,
             real(fgsl_double), dimension(:), intent(in), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.40.1.37 fgsl_stats_wskew_m_sd()

```
real(fgsl_double) function fgsl_stats_wskew_m_sd (
             real(fgsl_double), dimension(:), intent(in), target, contiguous w,
             integer(fgsl_size_t), intent(in) wstride,
             real(fgsl_double), dimension(:), intent(in), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n,
             real(fgsl_double), intent(in) mean,
             real(fgsl_double), intent(in) sd )
```

49.40.1.38 fgsl_stats_wvariance()

```
real(fgsl_double) function fgsl_stats_wvariance (
             real(fgsl_double), dimension(:), intent(in), target, contiguous w,
             integer(fgsl_size_t), intent(in) wstride,
             real(fgsl_double), dimension(:), intent(in), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n )
```

49.40.1.39 fgsl_stats_wvariance_m()

```
real(fgsl_double) function fgsl_stats_wvariance_m (
             real(fgsl_double), dimension(:), intent(in), target, contiguous w,
             integer(fgsl_size_t), intent(in) wstride,
             real(fgsl_double), dimension(:), intent(in), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n,
             real(fgsl_double), intent(in) mean )
```

49.40.1.40 fgsl_stats_wvariance_with_fixed_mean()

```
real(fgsl_double) function fgsl_stats_wvariance_with_fixed_mean (
             real(fgsl_double), dimension(:), intent(in), target, contiguous w,
             integer(fgsl_size_t), intent(in) wstride,
             real(fgsl_double), dimension(:), intent(in), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n,
             real(fgsl_double), intent(in) mean )
```

49.41 api/sum_levin.finc File Reference

Functions/Subroutines

- type(fgsl_sum_levin_u_workspace) function fgsl_sum_levin_u_alloc (n)
- integer(fgsl_int) function fgsl_sum_levin_u_free (w)
- integer(fgsl_int) function fgsl_sum_levin_u_accel (array, array_size, w, sum_accel, abserr)
- type(fgsl_sum_levin_utrunc_workspace) function fgsl_sum_levin_utrunc_alloc (n)
- integer(fgsl_int) function fgsl_sum_levin_utrunc_free (w)
- integer(fgsl_int) function fgsl_sum_levin_utrunc_accel (array, array_size, w, sum_accel, abserr)

49.41.1 Function/Subroutine Documentation

49.41.1.1 fgsl_sum_levin_u_accel()

```
integer(fgsl_int) function fgsl_sum_levin_u_accel (
             real(fgsl_double), dimension(array_size), intent(in) array,
             integer(fgsl_size_t), intent(in) array_size,
             type(fgsl_sum_levin_u_workspace), intent(in) w,
             real(fgsl_double), intent(out) sum_accel,
             real(fgsl_double), intent(out) abserr )
```

49.41.1.2 fgsl_sum_levin_u_alloc()

```
type(fgsl_sum_levin_u_workspace) function fgsl_sum_levin_u_alloc (
             integer(fgsl_size_t), intent(in) n )
```

49.41.1.3 fgsl_sum_levin_u_free()

```
integer(fgsl_int) function fgsl_sum_levin_u_free (
             type(fgsl_sum_levin_u_workspace), intent(inout) w )
```

49.41.1.4 fgsl_sum_levin_utrunc_accel()

```
integer(fgsl_int) function fgsl_sum_levin_utrunc_accel (
             real(fgsl_double), dimension(array_size), intent(in) array,
             integer(fgsl_size_t), intent(in) array_size,
             type(fgsl_sum_levin_utrunc_workspace), intent(in) w,
             real(fgsl_double), intent(out) sum_accel,
             real(fgsl_double), intent(out) abserr )
```

49.41.1.5 fgsl_sum_levin_utrunc_alloc()

```
type(fgsl_sum_levin_utrunc_workspace) function fgsl_sum_levin_utrunc_alloc (
             integer(fgsl_size_t), intent(in) n )
```

49.41.1.6 fgsl_sum_levin_utrunc_free()

```
integer(fgsl_int) function fgsl_sum_levin_utrunc_free (
             type(fgsl_sum_levin_utrunc_workspace), intent(inout) w )
```

49.42 api/wavelet.finc File Reference

Functions/Subroutines

- type(fgsl_wavelet) function fgsl_wavelet_alloc (t, k)
- character(kind=fgsl_char, len=fgsl_strmax) function fgsl_wavelet_name (wavelet)
- subroutine fgsl_wavelet_free (w)
- type(fgsl_wavelet_workspace) function fgsl_wavelet_workspace_alloc (n)
- subroutine fgsl_wavelet_workspace_free (w)
- integer(fgsl_int) function fgsl_wavelet_transform (w, data, stride, n, dir, work)
- integer(fgsl_int) function fgsl_wavelet_transform_forward (w, data, stride, n, work)
- integer(fgsl_int) function fgsl_wavelet_transform_inverse (w, data, stride, n, work)
- integer(fgsl_int) function fgsl_wavelet2d_transform (w, data, tda, size1, size2, dir, work)
- integer(fgsl_int) function fgsl_wavelet2d_transform_forward (w, data, tda, size1, size2, work)
- integer(fgsl_int) function fgsl_wavelet2d_transform_inverse (w, data, tda, size1, size2, work)
- integer(fgsl_int) function fgsl_wavelet2d_transform_matrix (w, m, dir, work)
- integer(fgsl_int) function fgsl_wavelet2d_transform_matrix_forward (w, m, work)
- integer(fgsl_int) function fgsl_wavelet2d_transform_matrix_inverse (w, m, work)
- integer(fgsl_int) function fgsl_wavelet2d_nstransform (w, data, tda, size1, size2, dir, work)
- integer(fgsl_int) function fgsl_wavelet2d_nstransform_forward (w, data, tda, size1, size2, work)
- integer(fgsl_int) function fgsl_wavelet2d_nstransform_inverse (w, data, tda, size1, size2, work)
- integer(fgsl_int) function fgsl_wavelet2d_nstransform_matrix (w, m, dir, work)
- integer(fgsl_int) function fgsl_wavelet2d_nstransform_matrix_forward (w, m, work)
- integer(fgsl_int) function fgsl_wavelet2d_nstransform_matrix_inverse (w, m, work)
- logical function fgsl_wavelet_status (wavelet)
- logical function fgsl_wavelet_workspace_status (wavelet_workspace)
- integer(fgsl_size_t) function fgsl_sizeof_wavelet (w)
- integer(fgsl_size_t) function fgsl_sizeof_wavelet_workspace (w)

49.42.1 Function/Subroutine Documentation

49.42.1.1 fgsl_sizeof_wavelet()

```
integer(fgsl_size_t) function fgsl_sizeof_wavelet (
             type(fgsl_wavelet), intent(in) w )
```

49.42.1.2 fgsl_sizeof_wavelet_workspace()

```
integer(fgsl_size_t) function fgsl_sizeof_wavelet_workspace (
             type(fgsl_wavelet_workspace), intent(in) w )
```

49.42.1.3 fgsl_wavelet2d_nstransform()

```
integer(fgsl_int) function fgsl_wavelet2d_nstransform (
             type(fgsl_wavelet), intent(in) w,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous data,
             integer(fgsl_size_t), intent(in) tda,
             integer(fgsl_size_t), intent(in) size1,
             integer(fgsl_size_t), intent(in) size2,
             integer(fgsl_int), intent(in) dir,
             type(fgsl_wavelet_workspace), intent(inout) work )
```

49.42.1.4 fgsl_wavelet2d_nstransform_forward()

```
integer(fgsl_int) function fgsl_wavelet2d_nstransform_forward (
             type(fgsl_wavelet), intent(in) w,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous data,
             integer(fgsl_size_t), intent(in) tda,
             integer(fgsl_size_t), intent(in) size1,
             integer(fgsl_size_t), intent(in) size2,
             type(fgsl_wavelet_workspace), intent(inout) work )
```

49.42.1.5 fgsl_wavelet2d_nstransform_inverse()

```
integer(fgsl_int) function fgsl_wavelet2d_nstransform_inverse (
             type(fgsl_wavelet), intent(in) w,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous data,
             integer(fgsl_size_t), intent(in) tda,
             integer(fgsl_size_t), intent(in) size1,
             integer(fgsl_size_t), intent(in) size2,
             type(fgsl_wavelet_workspace), intent(inout) work )
```

49.42.1.6 fgsl_wavelet2d_nstransform_matrix()

```
integer(fgsl_int) function fgsl_wavelet2d_nstransform_matrix (
             type(fgsl_wavelet), intent(in) w,
             type(fgsl_matrix), intent(inout) m,
             integer(fgsl_int), intent(in) dir,
             type(fgsl_wavelet_workspace) work )
```

49.42.1.7 fgsl_wavelet2d_nstransform_matrix_forward()

```
integer(fgsl_int) function fgsl_wavelet2d_nstransform_matrix_forward (
             type(fgsl_wavelet), intent(in) w,
             type(fgsl_matrix), intent(inout) m,
             type(fgsl_wavelet_workspace) work )
```

49.42.1.8 fgsl_wavelet2d_nstransform_matrix_inverse()

```
integer(fgsl_int) function fgsl_wavelet2d_nstransform_matrix_inverse (
            type(fgsl_wavelet), intent(in) w,
            type(fgsl_matrix), intent(inout) m,
            type(fgsl_wavelet_workspace) work )
```

49.42.1.9 fgsl_wavelet2d_transform()

```
integer(fgsl_int) function fgsl_wavelet2d_transform (
            type(fgsl_wavelet), intent(in) w,
            real(fgsl_double), dimension(:), intent(inout), target, contiguous data,
            integer(fgsl_size_t), intent(in) tda,
            integer(fgsl_size_t), intent(in) size1,
            integer(fgsl_size_t), intent(in) size2,
            integer(fgsl_int), intent(in) dir,
            type(fgsl_wavelet_workspace), intent(inout) work )
```

49.42.1.10 fgsl_wavelet2d_transform_forward()

```
integer(fgsl_int) function fgsl_wavelet2d_transform_forward (
            type(fgsl_wavelet), intent(in) w,
            real(fgsl_double), dimension(:), intent(inout), target, contiguous data,
            integer(fgsl_size_t), intent(in) tda,
            integer(fgsl_size_t), intent(in) size1,
            integer(fgsl_size_t), intent(in) size2,
            type(fgsl_wavelet_workspace), intent(inout) work )
```

49.42.1.11 fgsl_wavelet2d_transform_inverse()

```
integer(fgsl_int) function fgsl_wavelet2d_transform_inverse (
            type(fgsl_wavelet), intent(in) w,
            real(fgsl_double), dimension(:), intent(inout), target, contiguous data,
            integer(fgsl_size_t), intent(in) tda,
            integer(fgsl_size_t), intent(in) size1,
            integer(fgsl_size_t), intent(in) size2,
            type(fgsl_wavelet_workspace), intent(inout) work )
```

49.42.1.12 fgsl_wavelet2d_transform_matrix()

```
integer(fgsl_int) function fgsl_wavelet2d_transform_matrix (
            type(fgsl_wavelet), intent(in) w,
            type(fgsl_matrix), intent(inout) m,
            integer(fgsl_int), intent(in) dir,
            type(fgsl_wavelet_workspace) work )
```

49.42.1.13 fgsl_wavelet2d_transform_matrix_forward()

```
integer(fgsl_int) function fgsl_wavelet2d_transform_matrix_forward (
             type(fgsl_wavelet), intent(in) w,
             type(fgsl_matrix), intent(inout) m,
             type(fgsl_wavelet_workspace) work )
```

49.42.1.14 fgsl_wavelet2d_transform_matrix_inverse()

```
integer(fgsl_int) function fgsl_wavelet2d_transform_matrix_inverse (
             type(fgsl_wavelet), intent(in) w,
             type(fgsl_matrix), intent(inout) m,
             type(fgsl_wavelet_workspace) work )
```

49.42.1.15 fgsl_wavelet_alloc()

```
type(fgsl_wavelet) function fgsl_wavelet_alloc (
             type(fgsl_wavelet_type), intent(in) t,
             integer(fgsl_size_t), intent(in) k )
```

49.42.1.16 fgsl_wavelet_free()

```
subroutine fgsl_wavelet_free (
             type(fgsl_wavelet), intent(inout) w )
```

49.42.1.17 fgsl_wavelet_name()

```
character(kind=fgsl_char,len=fgsl_strmax) function fgsl_wavelet_name (
             type(fgsl_wavelet), intent(in) wavelet )
```

49.42.1.18 fgsl_wavelet_status()

```
logical function fgsl_wavelet_status (
             type(fgsl_wavelet), intent(in) wavelet )
```

49.42.1.19 fgsl_wavelet_transform()

```
integer(fgsl_int) function fgsl_wavelet_transform (
             type(fgsl_wavelet), intent(in) w,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n,
             integer(fgsl_int), intent(in) dir,
             type(fgsl_wavelet_workspace), intent(inout) work )
```

49.42.1.20 fgsl_wavelet_transform_forward()

```
integer(fgsl_int) function fgsl_wavelet_transform_forward (
             type(fgsl_wavelet), intent(in) w,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n,
             type(fgsl_wavelet_workspace), intent(inout) work )
```

49.42.1.21 fgsl_wavelet_transform_inverse()

```
integer(fgsl_int) function fgsl_wavelet_transform_inverse (
             type(fgsl_wavelet), intent(in) w,
             real(fgsl_double), dimension(:), intent(inout), target, contiguous data,
             integer(fgsl_size_t), intent(in) stride,
             integer(fgsl_size_t), intent(in) n,
             type(fgsl_wavelet_workspace), intent(inout) work )
```

49.42.1.22 fgsl_wavelet_workspace_alloc()

```
type(fgsl_wavelet_workspace) function fgsl_wavelet_workspace_alloc (
             integer(fgsl_size_t), intent(in) n )
```

49.42.1.23 fgsl_wavelet_workspace_free()

```
subroutine fgsl_wavelet_workspace_free (
             type(fgsl_wavelet_workspace), intent(inout) w )
```

49.42.1.24 fgsl_wavelet_workspace_status()

```
logical function fgsl_wavelet_workspace_status (
             type(fgsl_wavelet_workspace), intent(in) wavelet_workspace )
```

49.43 fgsl.F90 File Reference

```
#include "config.h"
#include "interface/error.finc"
#include "interface/misc.finc"
#include "interface/io.finc"
#include "interface/math.finc"
#include "interface/complex.finc"
#include "interface/poly.finc"
#include "interface/specfunc.finc"
#include "interface/array.finc"
#include "interface/interp.finc"
#include "interface/permutation.finc"
#include "interface/sort.finc"
#include "interface/linalg.finc"
#include "interface/eigen.finc"
#include "interface/fft.finc"
#include "interface/integration.finc"
#include "interface/rng.finc"
#include "interface/statistics.finc"
#include "interface/histogram.finc"
#include "interface/ntuple.finc"
#include "interface/montecarlo.finc"
#include "interface/siman.finc"
#include "interface/ode.finc"
#include "interface/deriv.finc"
#include "interface/chebyshev.finc"
#include "interface/sum_levin.finc"
#include "interface/wavelet.finc"
#include "interface/dht.finc"
#include "interface/roots.finc"
#include "interface/min.finc"
#include "interface/multiroots.finc"
#include "interface/multimin.finc"
#include "interface/fit.finc"
#include "interface/nlfit.finc"
#include "interface/multifit.finc"
#include "interface/bspline.finc"
#include "interface/ieee.finc"
#include "interface/multilarge.finc"
#include "interface/spmatrix.finc"
#include "interface/splinalg.finc"
#include "interface/rstat.finc"
#include "interface/movstat.finc"
#include "interface/filter.finc"
#include "interface/generics.finc"
#include "api/error.finc"
#include "api/misc.finc"
#include "api/io.finc"
#include "api/math.finc"
```

```
#include "api/complex.finc"
#include "api/poly.finc"
#include "api/specfunc.finc"
#include "api/array.finc"
```

Include dependency graph for fgsl.F90:

Data Types

- type fgsl::fgsl_error_handler_t
- type fgsl::fgsl_file
- type fgsl::fgsl_function
- type fgsl::fgsl_function_fdf
- type fgsl::gsl_complex
- type fgsl::fgsl_poly_complex_workspace
- type fgsl::fgsl_sf_result
- type fgsl::gsl_sf_result
- type fgsl::fgsl_sf_result_e10
- type fgsl::gsl_sf_result_e10
- type fgsl::fgsl_mode_t
- type fgsl::fgsl_sf_legendre_t
- type fgsl::fgsl_sf_mathieu_workspace
- type fgsl::fgsl_vector
- type fgsl::fgsl_vector_int
- type fgsl::fgsl_matrix
- type fgsl::fgsl_vector_complex
- type fgsl::fgsl_matrix_complex
- type fgsl::fgsl_multilarge_linear_type
- type fgsl::fgsl_multilarge_linear_workspace
- type fgsl::fgsl_interp_type
- type fgsl::fgsl_interp
- type fgsl::fgsl_interp_accel
- type fgsl::fgsl_spline
- type fgsl::fgsl_spline2d
- type fgsl::fgsl_interp2d_type
- type fgsl::fgsl_interp2d
- type fgsl::fgsl_permutation
- type fgsl::fgsl_combination
- type fgsl::fgsl_multiset
- type fgsl::fgsl_multifit_robust_type
- type fgsl::fgsl_multifit_robust_workspace
- type fgsl::fgsl_multifit_robust_stats
- type fgsl::fgsl_eigen_symm_workspace
- type fgsl::fgsl_eigen_symmv_workspace
- type fgsl::fgsl_eigen_herm_workspace
- type fgsl::fgsl_eigen_hermv_workspace
- type fgsl::fgsl_eigen_nonsymm_workspace
- type fgsl::fgsl_eigen_nonsymmv_workspace
- type fgsl::fgsl_eigen_gensymm_workspace
- type fgsl::fgsl_eigen_gensymmv_workspace
- type fgsl::fgsl_eigen_genherm_workspace
- type fgsl::fgsl_eigen_genhermv_workspace

- type fgsl::fgsl_eigen_gen_workspace
- type fgsl::fgsl_eigen_genv_workspace
- type fgsl::fgsl_fft_complex_wavetable
- type fgsl::fgsl_fft_real_wavetable
- type fgsl::fgsl_fft_halfcomplex_wavetable
- type fgsl::fgsl_fft_complex_workspace
- type fgsl::fgsl_fft_real_workspace
- type fgsl::fgsl_integration_workspace
- type fgsl::fgsl_integration_qaws_table
- type fgsl::fgsl_integration_qawo_table
- type fgsl::fgsl_integration_cquad_workspace
- type fgsl::fgsl_integration_romberg_workspace
- type fgsl::fgsl_integration_glfixed_table
- type fgsl::fgsl_integration_fixed_workspace
- type fgsl::fgsl_rng
- type fgsl::fgsl_rng_type
- type fgsl::fgsl_qrng
- type fgsl::fgsl_qrng_type
- type fgsl::fgsl_ran_discrete_t
- type fgsl::fgsl_histogram
- type fgsl::fgsl_histogram_pdf
- type fgsl::fgsl_histogram2d
- type fgsl::fgsl_histogram2d_pdf
- type fgsl::fgsl_ntuple
- type fgsl::fgsl_ntuple_select_fn
- type fgsl::fgsl_ntuple_value_fn
- type fgsl::fgsl_monte_function
- type fgsl::fgsl_monte_plain_state
- type fgsl::fgsl_monte_miser_state
- type fgsl::fgsl_monte_vegas_state
- type fgsl::fgsl_siman_params_t
- type fgsl::fgsl_odeiv2_system
- type fgsl::fgsl_odeiv2_step_type
- type fgsl::fgsl_odeiv2_step
- type fgsl::fgsl_odeiv2_driver
- type fgsl::fgsl_odeiv2_control_type
- type fgsl::fgsl_odeiv2_control
- type fgsl::fgsl_odeiv2_evolve
- type fgsl::fgsl_odeiv_system
- type fgsl::fgsl_odeiv_step_type
- type fgsl::fgsl_odeiv_step
- type fgsl::fgsl_odeiv_control
- type fgsl::fgsl_odeiv_control_type
- type fgsl::fgsl_odeiv_evolve
- type fgsl::fgsl_cheb_series
- type fgsl::fgsl_sum_levin_u_workspace
- type fgsl::fgsl_sum_levin_utrunc_workspace
- type fgsl::fgsl_wavelet
- type fgsl::fgsl_wavelet_type
- type fgsl::fgsl_wavelet_workspace
- type fgsl::fgsl_dht
- type fgsl::fgsl_root_fsolver_type
- type fgsl::fgsl_root_fdfsolver_type
- type fgsl::fgsl_root_fsolver
- type fgsl::fgsl_root_fdfsolver

- type fgsl::fgsl_min_fminimizer_type
- type fgsl::fgsl_min_fminimizer
- type fgsl::fgsl_multiroot_function
- type fgsl::fgsl_multiroot_function_fdf
- type fgsl::fgsl_multiroot_fsolver
- type fgsl::fgsl_multiroot_fsolver_type
- type fgsl::fgsl_multiroot_fdfsolver
- type fgsl::fgsl_multiroot_fdfsolver_type
- type fgsl::fgsl_multimin_function
- type fgsl::fgsl_multimin_function_fdf
- type fgsl::fgsl_multimin_fminimizer
- type fgsl::fgsl_multimin_fminimizer_type
- type fgsl::fgsl_multimin_fdfminimizer
- type fgsl::fgsl_multimin_fdfminimizer_type
- type fgsl::fgsl_multifit_linear_workspace
- type fgsl::fgsl_multifit_nlinear_type
- type fgsl::fgsl_multifit_nlinear_workspace
- type fgsl::fgsl_multifit_nlinear_parameters
- type fgsl::fgsl_multilarge_nlinear_type
- type fgsl::fgsl_multilarge_nlinear_workspace
- type fgsl::fgsl_multilarge_nlinear_parameters
- type fgsl::fgsl_multifit_nlinear_fdf
- type fgsl::fgsl_multilarge_nlinear_fdf
- interface fgsl::fgsl_nlinear_callback
- type fgsl::fgsl_multifit_function
- type fgsl::fgsl_multifit_function_fdf
- type fgsl::fgsl_multifit_fsolver
- type fgsl::fgsl_multifit_fsolver_type
- type fgsl::fgsl_multifit_fdfsolver
- type fgsl::fgsl_multifit_fdfsolver_type
- type fgsl::fgsl_multifit_fdfridge
- type fgsl::fgsl_bspline_workspace
- type fgsl::fgsl_spmatrix
- type fgsl::fgsl_splinalg_itersolve_type
- type fgsl::fgsl_splinalg_itersolve
- type fgsl::fgsl_rstat_quantile_workspace
- type fgsl::fgsl_rstat_workspace
- type fgsl::fgsl_movstat_workspace
- type fgsl::fgsl_movstat_function

  fgsl_movstat_function interoperates with gsl_movstat_function
- type fgsl::fgsl_filter_gaussian_workspace
- type fgsl::fgsl_filter_median_workspace
- type fgsl::fgsl_filter_rmedian_workspace
- type fgsl::fgsl_filter_impulse_workspace

Modules

- module fgsl

Variables

- integer, parameter, public fgsl::fgsl_double = c_double
- integer, parameter, public fgsl::fgsl_double_complex = c_double_complex
- integer, parameter, public fgsl::fgsl_extended = selected_real_kind(13)
- integer, parameter, public fgsl::fgsl_float = c_float
- integer, parameter, public fgsl::fgsl_int = c_int
- integer, parameter, public fgsl::fgsl_long = c_long
- integer, parameter, public fgsl::fgsl_size_t = c_size_t
- integer, parameter, public fgsl::fgsl_char = c_char
- integer, parameter, public fgsl::fgsl_strmax = 128
- integer, parameter, public fgsl::fgsl_pathmax = 2048
- character(kind=fgsl_char, len= ∗), parameter, public fgsl::fgsl_version =PACKAGE_VERSION
- character(kind=fgsl_char, len= ∗), parameter, public fgsl::fgsl_gslbase =GSL_VERSION
- integer(fgsl_int), parameter, public fgsl::fgsl_success = 0
- integer(fgsl_int), parameter, public fgsl::fgsl_failure = -1
- integer(fgsl_int), parameter, public fgsl::fgsl_continue = -2
- integer(fgsl_int), parameter, public fgsl::fgsl_edom = 1
- integer(fgsl_int), parameter, public fgsl::fgsl_erange = 2
- integer(fgsl_int), parameter, public fgsl::fgsl_efault = 3
- integer(fgsl_int), parameter, public fgsl::fgsl_einval = 4
- integer(fgsl_int), parameter, public fgsl::fgsl_efactor = 6
- integer(fgsl_int), parameter, public fgsl::fgsl_esanity = 7
- integer(fgsl_int), parameter, public fgsl::fgsl_enomem = 8
- integer(fgsl_int), parameter, public fgsl::fgsl_ebadfunc = 9
- integer(fgsl_int), parameter, public fgsl::fgsl_erunaway = 10
- integer(fgsl_int), parameter, public fgsl::fgsl_emaxiter = 11
- integer(fgsl_int), parameter, public fgsl::fgsl_ezerodiv = 12
- integer(fgsl_int), parameter, public fgsl::fgsl_ebadtol = 13
- integer(fgsl_int), parameter, public fgsl::fgsl_etol = 14
- integer(fgsl_int), parameter, public fgsl::fgsl_eundrflw = 15
- integer(fgsl_int), parameter, public fgsl::fgsl_eovrflw = 16
- integer(fgsl_int), parameter, public fgsl::fgsl_eloss = 17
- integer(fgsl_int), parameter, public fgsl::fgsl_eround = 18
- integer(fgsl_int), parameter, public fgsl::fgsl_ebadlen = 19
- integer(fgsl_int), parameter, public fgsl::fgsl_enotsqr = 20
- integer(fgsl_int), parameter, public fgsl::fgsl_esing = 21
- integer(fgsl_int), parameter, public fgsl::fgsl_ediverge = 22
- integer(fgsl_int), parameter, public fgsl::fgsl_eunsup = 23
- integer(fgsl_int), parameter, public fgsl::fgsl_eunimpl = 24
- integer(fgsl_int), parameter, public fgsl::fgsl_ecache = 25
- integer(fgsl_int), parameter, public fgsl::fgsl_etable = 26
- integer(fgsl_int), parameter, public fgsl::fgsl_enoprog = 27
- integer(fgsl_int), parameter, public fgsl::fgsl_enoprogj = 28
- integer(fgsl_int), parameter, public fgsl::fgsl_etolf = 29
- integer(fgsl_int), parameter, public fgsl::fgsl_etolx = 30
- integer(fgsl_int), parameter, public fgsl::fgsl_etolg = 31
- integer(fgsl_int), parameter, public fgsl::fgsl_eof = 32
- real(fgsl_extended), parameter, public fgsl::m_e = 2.71828182845904523536028747135_fgsl_extended
- real(fgsl_extended), parameter, public fgsl::m_log2e = 1.44269504088896340735992468100_fgsl_extended
- real(fgsl_extended), parameter, public fgsl::m_log10e = 0.43429448190325182765112891892_fgsl_↩ extended
- real(fgsl_extended), parameter, public fgsl::m_sqrt2 = 1.41421356237309504880168872421_fgsl_extended
- real(fgsl_extended), parameter, public fgsl::m_sqrt1_2 = 0.70710678118654752440084436210_fgsl_↩ extended

- real(fgsl_extended), parameter, public fgsl::m_sqrt3 = 1.732050807568877293527446341 51_fgsl_extended
- real(fgsl_extended), parameter, public fgsl::m_pi = 3.14159265358979323846264338328_fgsl_extended
- real(fgsl_extended), parameter, public fgsl::m_pi_2 = 1.57079632679489661923132169164_fgsl_extended
- real(fgsl_extended), parameter, public fgsl::m_pi_4 = 0.78539816339744830961566084582_fgsl_extended
- real(fgsl_extended), parameter, public fgsl::m_sqrtpi = 1.77245385090551602729816748334_fgsl_extended
- real(fgsl_extended), parameter, public fgsl::m_2_sqrtpi = 1.12837916709551257389615890312_fgsl_↩ extended
- real(fgsl_extended), parameter, public fgsl::m_1_pi = 0.31830988618379067153776752675_fgsl_extended
- real(fgsl_extended), parameter, public fgsl::m_2_pi = 0.63661977236758134307553505349_fgsl_extended
- real(fgsl_extended), parameter, public fgsl::m_ln10 = 2.30258509299404568401799145468_fgsl_extended
- real(fgsl_extended), parameter, public fgsl::m_ln2 = 0.69314718055994530941723212146_fgsl_extended
- real(fgsl_extended), parameter, public fgsl::m_lnpi = 1.14472988584940017414342735135_fgsl_extended
- real(fgsl_extended), parameter, public fgsl::m_euler = 0.57721566490153286060651209008_fgsl_extended
- real(fgsl_double), parameter, public fgsl::fgsl_const_num_fine_structure = 7.297352533E-3_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_num_avogadro = 6.02214199E23_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_num_yotta = 1e24_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_num_zetta = 1e21_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_num_exa = 1e18_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_num_peta = 1e15_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_num_tera = 1e12_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_num_giga = 1e9_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_num_mega = 1e6_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_num_kilo = 1e3_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_num_milli = 1e-3_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_num_micro = 1e-6_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_num_nano = 1e-9_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_num_pico = 1e-12_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_num_femto = 1e-15_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_num_atto = 1e-18_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_num_zepto = 1e-21_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_num_yocto = 1e-24_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_speed_of_light = 2.99792458e8_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_gravitational_constant = 6.673e-11_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_plancks_constant_h = 6.62606896e-34_fgsl_↩ double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_plancks_constant_hbar = 1.05457162825e-34_↩ fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_astronomical_unit = 1.49597870691e11_fgsl_↩ double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_light_year = 9.46053620707e15_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_parsec = 3.08567758135e16_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_grav_accel = 9.80665e0_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_electron_volt = 1.602176487e-19_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_mass_electron = 9.10938188e-31_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_mass_muon = 1.88353109e-28_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_mass_proton = 1.67262158e-27_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_mass_neutron = 1.67492716e-27_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_rydberg = 2.17987196968e-18_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_boltzmann = 1.3806504e-23_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_bohr_magneton = 9.27400899e-24_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_nuclear_magneton = 5.05078317e-27_fgsl_↩ double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_electron_magnetic_moment = 9.28476362e-24↩ _fgsl_double

- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_proton_magnetic_moment = 1.410606633e-26↩ _fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_molar_gas = 8.314472e0_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_standard_gas_volume = 2.2710981e-2_fgsl_↩ double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_minute = 6e1_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_hour = 3.6e3_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_day = 8.64e4_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_week = 6.048e5_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_inch = 2.54e-2_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_foot = 3.048e-1_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_yard = 9.144e-1_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_mile = 1.609344e3_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_nautical_mile = 1.852e3_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_fathom = 1.8288e0_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_mil = 2.54e-5_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_point = 3.52777777778e-4_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_texpoint = 3.51459803515e-4_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_micron = 1e-6_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_angstrom = 1e-10_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_hectare = 1e4_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_acre = 4.04685642241e3_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_barn = 1e-28_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_liter = 1e-3_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_us_gallon = 3.78541178402e-3_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_quart = 9.46352946004e-4_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_pint = 4.73176473002e-4_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_cup = 2.36588236501e-4_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_fluid_ounce = 2.95735295626e-5_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_tablespoon = 1.47867647813e-5_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_teaspoon = 4.92892159375e-6_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_canadian_gallon = 4.54609e-3_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_uk_gallon = 4.546092e-3_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_miles_per_hour = 4.4704e-1_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_kilometers_per_hour = 2.77777777778e-1_fgsl↩ _double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_knot = 5.14444444444e-1_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_pound_mass = 4.5359237e-1_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_ounce_mass = 2.8349523125e-2_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_ton = 9.0718474e2_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_metric_ton = 1e3_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_uk_ton = 1.0160469088e3_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_troy_ounce = 3.1103475e-2_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_carat = 2e-4_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_unified_atomic_mass = 1.660538782e-27_fgsl↩ _double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_gram_force = 9.80665e-3_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_pound_force = 4.44822161526e0_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_kilopound_force = 4.44822161526e3_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_poundal = 1.38255e-1_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_calorie = 4.1868e0_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_btu = 1.05505585262e3_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_therm = 1.05506e8_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_horsepower = 7.457e2_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_bar = 1e5_fgsl_double

- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_std_atmosphere = 1.01325e5_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_torr = 1.33322368421e2_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_meter_of_mercury = 1.33322368421e5_fgsl_↩ double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_inch_of_mercury = 3.38638815789e3_fgsl_↩ double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_inch_of_water = 2.490889e2_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_psi = 6.89475729317e3_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_poise = 1e-1_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_stokes = 1e-4_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_faraday = 9.64853429775e4_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_electron_charge = 1.602176487e-19_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_gauss = 1e-4_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_stilb = 1e4_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_lumen = 1e0_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_lux = 1e0_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_phot = 1e4_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_footcandle = 1.076e1_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_lambert = 1e4_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_footlambert = 1.07639104e1_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_curie = 3.7e10_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_roentgen = 2.58e-4_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_rad = 1e-2_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_solar_mass = 1.98892e30_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_bohr_radius = 5.291772083e-11_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_newton = 1e0_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_dyne = 1e-5_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_joule = 1e0_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_erg = 1e-7_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_stefan_boltzmann_constant = 5.67040047374e-8_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_thomson_cross_section = 6.65245893699e-29↩ _fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_vacuum_permittivity = 8.854187817e-12_fgsl_↩ double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_vacuum_permeability = 1.25663706144e-6_↩ fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_mksa_debye = 3.33564095198e-30_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_speed_of_light = 2.99792458e10_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_gravitational_constant = 6.673e-8_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_plancks_constant_h = 6.62606896e-27_fgsl_↩ double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_plancks_constant_hbar = 1.05457162825e-27_↩ fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_astronomical_unit = 1.49597870691e13_fgsl_↩ double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_light_year = 9.46053620707e17_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_parsec = 3.08567758135e18_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_grav_accel = 9.80665e2_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_electron_volt = 1.602176487e-12_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_mass_electron = 9.10938188e-28_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_mass_muon = 1.88353109e-25_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_mass_proton = 1.67262158e-24_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_mass_neutron = 1.67492716e-24_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_rydberg = 2.17987196968e-11_fgsl_double

- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_boltzmann = 1.3806504e-16_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_bohr_magneton = 9.27400899e-21_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_nuclear_magneton = 5.05078317e-24_fgsl_↩ double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_electron_magnetic_moment = 9.28476362e-21↩ _fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_proton_magnetic_moment = 1.410606633e-23↩ _fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_molar_gas = 8.314472e7_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_standard_gas_volume = 2.2710981e4_fgsl_↩ double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_minute = 6e1_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_hour = 3.6e3_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_day = 8.64e4_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_week = 6.048e5_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_inch = 2.54e0_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_foot = 3.048e1_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_yard = 9.144e1_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_mile = 1.609344e5_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_nautical_mile = 1.852e5_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_fathom = 1.8288e2_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_mil = 2.54e-3_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_point = 3.52777777778e-2_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_texpoint = 3.51459803515e-2_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_micron = 1e-4_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_angstrom = 1e-8_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_hectare = 1e8_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_acre = 4.04685642241e7_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_barn = 1e-24_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_liter = 1e3_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_us_gallon = 3.78541178402e3_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_quart = 9.46352946004e2_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_pint = 4.73176473002e2_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_cup = 2.36588236501e2_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_fluid_ounce = 2.95735295626e1_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_tablespoon = 1.47867647813e1_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_teaspoon = 4.92892159375e0_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_canadian_gallon = 4.54609e3_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_uk_gallon = 4.546092e3_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_miles_per_hour = 4.4704e1_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_kilometers_per_hour = 2.77777777778e1_fgsl↩ _double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_knot = 5.14444444444e1_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_pound_mass = 4.5359237e2_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_ounce_mass = 2.8349523125e1_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_ton = 9.0718474e5_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_metric_ton = 1e6_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_uk_ton = 1.0160469088e6_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_troy_ounce = 3.1103475e1_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_carat = 2e-1_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_unified_atomic_mass = 1.660538782e-24_fgsl↩ _double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_gram_force = 9.80665e2_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_pound_force = 4.44822161526e5_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_kilopound_force = 4.44822161526e8_fgsl_double

- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_poundal = 1.38255e4_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_calorie = 4.1868e7_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_btu = 1.05505585262e10_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_therm = 1.05506e15_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_horsepower = 7.457e9_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_bar = 1e6_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_std_atmosphere = 1.01325e6_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_torr = 1.33322368421e3_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_meter_of_mercury = 1.33322368421e6_fgsl_↩ double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_inch_of_mercury = 3.38638815789e4_fgsl_↩ double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_inch_of_water = 2.490889e3_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_psi = 6.89475729317e4_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_poise = 1e0_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_stokes = 1e0_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_faraday = 9.64853429775e3_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_electron_charge = 1.602176487e-20_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_gauss = 1e0_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_stilb = 1e0_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_lumen = 1e0_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_lux = 1e-4_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_phot = 1e0_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_footcandle = 1.076e-3_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_lambert = 1e0_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_footlambert = 1.07639104e-3_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_curie = 3.7e10_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_roentgen = 2.58e-8_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_rad = 1e2_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_solar_mass = 1.98892e33_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_bohr_radius = 5.291772083e-9_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_newton = 1e5_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_dyne = 1e0_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_joule = 1e7_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_erg = 1e0_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_stefan_boltzmann_constant = 5.67040047374e-5_fgsl_double
- real(fgsl_double), parameter, public fgsl::fgsl_const_cgsm_thomson_cross_section = 6.65245893699e-25↩ _fgsl_double
- type(fgsl_mode_t), parameter, public fgsl::fgsl_prec_double = fgsl_mode_t(0)
- type(fgsl_mode_t), parameter, public fgsl::fgsl_prec_single = fgsl_mode_t(1)
- type(fgsl_mode_t), parameter, public fgsl::fgsl_prec_approx = fgsl_mode_t(2)
- type(fgsl_sf_legendre_t), parameter, public fgsl::fgsl_sf_legendre_schmidt = fgsl_sf_legendre_t(0)
- type(fgsl_sf_legendre_t), parameter, public fgsl::fgsl_sf_legendre_spharm = fgsl_sf_legendre_t(1)
- type(fgsl_sf_legendre_t), parameter, public fgsl::fgsl_sf_legendre_full = fgsl_sf_legendre_t(2)
- type(fgsl_sf_legendre_t), parameter, public fgsl::fgsl_sf_legendre_none = fgsl_sf_legendre_t(3)
- integer(fgsl_int), parameter, public fgsl::gsl_sf_legendre_schmidt = 0
- integer(fgsl_int), parameter, public fgsl::gsl_sf_legendre_spharm = 1
- integer(fgsl_int), parameter, public fgsl::gsl_sf_legendre_full = 2
- integer(fgsl_int), parameter, public fgsl::gsl_sf_legendre_none = 3
- type(fgsl_multilarge_linear_type), parameter, public fgsl::fgsl_multilarge_linear_normal = fgsl_multilarge_↩ linear_type(1)
- type(fgsl_multilarge_linear_type), parameter, public fgsl::fgsl_multilarge_linear_tsqr = fgsl_multilarge_↩ linear_type(2)
- type(fgsl_interp_type), parameter, public fgsl::fgsl_interp_linear = fgsl_interp_type(1)

- type(fgsl_interp_type), parameter, public fgsl::fgsl_interp_polynomial = fgsl_interp_type(2)
- type(fgsl_interp_type), parameter, public fgsl::fgsl_interp_cspline = fgsl_interp_type(3)
- type(fgsl_interp_type), parameter, public fgsl::fgsl_interp_cspline_periodic = fgsl_interp_type(4)
- type(fgsl_interp_type), parameter, public fgsl::fgsl_interp_akima = fgsl_interp_type(5)
- type(fgsl_interp_type), parameter, public fgsl::fgsl_interp_akima_periodic = fgsl_interp_type(6)
- type(fgsl_interp_type), parameter, public fgsl::fgsl_interp_steffen = fgsl_interp_type(7)
- type(fgsl_interp2d_type), parameter, public fgsl::fgsl_interp2d_bilinear = fgsl_interp2d_type(1)
- type(fgsl_interp2d_type), parameter, public fgsl::fgsl_interp2d_bicubic = fgsl_interp2d_type(2)
- type(fgsl_multifit_robust_type), parameter, public fgsl::fgsl_multifit_robust_default = fgsl_multifit_robust_type(1)
- type(fgsl_multifit_robust_type), parameter, public fgsl::fgsl_multifit_robust_bisquare = fgsl_multifit_robust_type(2)
- type(fgsl_multifit_robust_type), parameter, public fgsl::fgsl_multifit_robust_cauchy = fgsl_multifit_robust_type(3)
- type(fgsl_multifit_robust_type), parameter, public fgsl::fgsl_multifit_robust_fair = fgsl_multifit_robust_type(4)
- type(fgsl_multifit_robust_type), parameter, public fgsl::fgsl_multifit_robust_huber = fgsl_multifit_robust_type(5)
- type(fgsl_multifit_robust_type), parameter, public fgsl::fgsl_multifit_robust_ols = fgsl_multifit_robust_type(6)
- type(fgsl_multifit_robust_type), parameter, public fgsl::fgsl_multifit_robust_welsch = fgsl_multifit_robust_type(7)
- integer(c_int), parameter, public fgsl::fgsl_eigen_sort_val_asc = 0
- integer(c_int), parameter, public fgsl::fgsl_eigen_sort_val_desc = 1
- integer(c_int), parameter, public fgsl::fgsl_eigen_sort_abs_asc = 2
- integer(c_int), parameter, public fgsl::fgsl_eigen_sort_abs_desc = 3
- integer(fgsl_int), parameter, public fgsl::fgsl_integ_gauss15 = 1
- integer(fgsl_int), parameter, public fgsl::fgsl_integ_gauss21 = 2
- integer(fgsl_int), parameter, public fgsl::fgsl_integ_gauss31 = 3
- integer(fgsl_int), parameter, public fgsl::fgsl_integ_gauss41 = 4
- integer(fgsl_int), parameter, public fgsl::fgsl_integ_gauss51 = 5
- integer(fgsl_int), parameter, public fgsl::fgsl_integ_gauss61 = 6
- integer(fgsl_int), parameter, public fgsl::fgsl_integ_cosine = 0
- integer(fgsl_int), parameter, public fgsl::fgsl_integ_sine = 1
- integer(fgsl_int), parameter, public fgsl::fgsl_integration_fixed_legendre = 1
- integer(fgsl_int), parameter, public fgsl::fgsl_integration_fixed_chebyshev = 2
- integer(fgsl_int), parameter, public fgsl::fgsl_integration_fixed_gegenbauer = 3
- integer(fgsl_int), parameter, public fgsl::fgsl_integration_fixed_jacobi = 4
- integer(fgsl_int), parameter, public fgsl::fgsl_integration_fixed_laguerre = 5
- integer(fgsl_int), parameter, public fgsl::fgsl_integration_fixed_hermite = 6
- integer(fgsl_int), parameter, public fgsl::fgsl_integration_fixed_exponential = 7
- integer(fgsl_int), parameter, public fgsl::fgsl_integration_fixed_rational = 8
- integer(fgsl_int), parameter, public fgsl::fgsl_integration_fixed_chebyshev2 = 9
- type(fgsl_rng_type), public fgsl::fgsl_rng_default = fgsl_rng_type(c_null_ptr, -1)
- type(fgsl_rng_type), public fgsl::fgsl_rng_borosh13 = fgsl_rng_type(c_null_ptr, 1)
- type(fgsl_rng_type), public fgsl::fgsl_rng_coveyou = fgsl_rng_type(c_null_ptr, 2)
- type(fgsl_rng_type), public fgsl::fgsl_rng_cmrg = fgsl_rng_type(c_null_ptr, 3)
- type(fgsl_rng_type), public fgsl::fgsl_rng_fishman18 = fgsl_rng_type(c_null_ptr, 4)
- type(fgsl_rng_type), public fgsl::fgsl_rng_fishman20 = fgsl_rng_type(c_null_ptr, 5)
- type(fgsl_rng_type), public fgsl::fgsl_rng_fishman2x = fgsl_rng_type(c_null_ptr, 6)
- type(fgsl_rng_type), public fgsl::fgsl_rng_gfsr4 = fgsl_rng_type(c_null_ptr, 7)
- type(fgsl_rng_type), public fgsl::fgsl_rng_knuthran = fgsl_rng_type(c_null_ptr, 8)
- type(fgsl_rng_type), public fgsl::fgsl_rng_knuthran2 = fgsl_rng_type(c_null_ptr, 9)
- type(fgsl_rng_type), public fgsl::fgsl_rng_lecuyer21 = fgsl_rng_type(c_null_ptr, 10)
- type(fgsl_rng_type), public fgsl::fgsl_rng_minstd = fgsl_rng_type(c_null_ptr, 11)
- type(fgsl_rng_type), public fgsl::fgsl_rng_mrg = fgsl_rng_type(c_null_ptr, 12)
- type(fgsl_rng_type), public fgsl::fgsl_rng_mt19937 = fgsl_rng_type(c_null_ptr, 13)

- type(fgsl_rng_type), public fgsl::fgsl_rng_mt19937_1999 = fgsl_rng_type(c_null_ptr, 14)
- type(fgsl_rng_type), public fgsl::fgsl_rng_mt19937_1998 = fgsl_rng_type(c_null_ptr, 15)
- type(fgsl_rng_type), public fgsl::fgsl_rng_r250 = fgsl_rng_type(c_null_ptr, 16)
- type(fgsl_rng_type), public fgsl::fgsl_rng_ran0 = fgsl_rng_type(c_null_ptr, 17)
- type(fgsl_rng_type), public fgsl::fgsl_rng_ran1 = fgsl_rng_type(c_null_ptr, 18)
- type(fgsl_rng_type), public fgsl::fgsl_rng_ran2 = fgsl_rng_type(c_null_ptr, 19)
- type(fgsl_rng_type), public fgsl::fgsl_rng_ran3 = fgsl_rng_type(c_null_ptr, 20)
- type(fgsl_rng_type), public fgsl::fgsl_rng_rand = fgsl_rng_type(c_null_ptr, 21)
- type(fgsl_rng_type), public fgsl::fgsl_rng_rand48 = fgsl_rng_type(c_null_ptr, 22)
- type(fgsl_rng_type), public fgsl::fgsl_rng_random128_bsd = fgsl_rng_type(c_null_ptr, 23)
- type(fgsl_rng_type), public fgsl::fgsl_rng_random128_glibc2 = fgsl_rng_type(c_null_ptr, 24)
- type(fgsl_rng_type), public fgsl::fgsl_rng_random128_libc5 = fgsl_rng_type(c_null_ptr, 25)
- type(fgsl_rng_type), public fgsl::fgsl_rng_random256_bsd = fgsl_rng_type(c_null_ptr, 26)
- type(fgsl_rng_type), public fgsl::fgsl_rng_random256_glibc2 = fgsl_rng_type(c_null_ptr, 27)
- type(fgsl_rng_type), public fgsl::fgsl_rng_random256_libc5 = fgsl_rng_type(c_null_ptr, 28)
- type(fgsl_rng_type), public fgsl::fgsl_rng_random32_bsd = fgsl_rng_type(c_null_ptr, 29)
- type(fgsl_rng_type), public fgsl::fgsl_rng_random32_glibc2 = fgsl_rng_type(c_null_ptr, 30)
- type(fgsl_rng_type), public fgsl::fgsl_rng_random32_libc5 = fgsl_rng_type(c_null_ptr, 31)
- type(fgsl_rng_type), public fgsl::fgsl_rng_random64_bsd = fgsl_rng_type(c_null_ptr, 32)
- type(fgsl_rng_type), public fgsl::fgsl_rng_random64_glibc2 = fgsl_rng_type(c_null_ptr, 33)
- type(fgsl_rng_type), public fgsl::fgsl_rng_random64_libc5 = fgsl_rng_type(c_null_ptr, 34)
- type(fgsl_rng_type), public fgsl::fgsl_rng_random8_bsd = fgsl_rng_type(c_null_ptr, 35)
- type(fgsl_rng_type), public fgsl::fgsl_rng_random8_glibc2 = fgsl_rng_type(c_null_ptr, 36)
- type(fgsl_rng_type), public fgsl::fgsl_rng_random8_libc5 = fgsl_rng_type(c_null_ptr, 37)
- type(fgsl_rng_type), public fgsl::fgsl_rng_random_bsd = fgsl_rng_type(c_null_ptr, 38)
- type(fgsl_rng_type), public fgsl::fgsl_rng_random_glibc2 = fgsl_rng_type(c_null_ptr, 39)
- type(fgsl_rng_type), public fgsl::fgsl_rng_random_libc5 = fgsl_rng_type(c_null_ptr, 40)
- type(fgsl_rng_type), public fgsl::fgsl_rng_randu = fgsl_rng_type(c_null_ptr, 41)
- type(fgsl_rng_type), public fgsl::fgsl_rng_ranf = fgsl_rng_type(c_null_ptr, 42)
- type(fgsl_rng_type), public fgsl::fgsl_rng_ranlux = fgsl_rng_type(c_null_ptr, 43)
- type(fgsl_rng_type), public fgsl::fgsl_rng_ranlux389 = fgsl_rng_type(c_null_ptr, 44)
- type(fgsl_rng_type), public fgsl::fgsl_rng_ranlxd1 = fgsl_rng_type(c_null_ptr, 45)
- type(fgsl_rng_type), public fgsl::fgsl_rng_ranlxd2 = fgsl_rng_type(c_null_ptr, 46)
- type(fgsl_rng_type), public fgsl::fgsl_rng_ranlxs0 = fgsl_rng_type(c_null_ptr, 47)
- type(fgsl_rng_type), public fgsl::fgsl_rng_ranlxs1 = fgsl_rng_type(c_null_ptr, 48)
- type(fgsl_rng_type), public fgsl::fgsl_rng_ranlxs2 = fgsl_rng_type(c_null_ptr, 49)
- type(fgsl_rng_type), public fgsl::fgsl_rng_ranmar = fgsl_rng_type(c_null_ptr, 50)
- type(fgsl_rng_type), public fgsl::fgsl_rng_slatec = fgsl_rng_type(c_null_ptr, 51)
- type(fgsl_rng_type), public fgsl::fgsl_rng_taus = fgsl_rng_type(c_null_ptr, 52)
- type(fgsl_rng_type), public fgsl::fgsl_rng_taus2 = fgsl_rng_type(c_null_ptr, 53)
- type(fgsl_rng_type), public fgsl::fgsl_rng_taus113 = fgsl_rng_type(c_null_ptr, 54)
- type(fgsl_rng_type), public fgsl::fgsl_rng_transputer = fgsl_rng_type(c_null_ptr, 55)
- type(fgsl_rng_type), public fgsl::fgsl_rng_tt800 = fgsl_rng_type(c_null_ptr, 56)
- type(fgsl_rng_type), public fgsl::fgsl_rng_uni = fgsl_rng_type(c_null_ptr, 57)
- type(fgsl_rng_type), public fgsl::fgsl_rng_uni32 = fgsl_rng_type(c_null_ptr, 58)
- type(fgsl_rng_type), public fgsl::fgsl_rng_vax = fgsl_rng_type(c_null_ptr, 59)
- type(fgsl_rng_type), public fgsl::fgsl_rng_waterman14 = fgsl_rng_type(c_null_ptr, 60)
- type(fgsl_rng_type), public fgsl::fgsl_rng_zuf = fgsl_rng_type(c_null_ptr, 61)
- type(fgsl_rng_type), public fgsl::fgsl_rng_knuthran2002 = fgsl_rng_type(c_null_ptr, 62)
- integer(fgsl_long), bind(C, name='gsl_rng_default_seed'), public fgsl::fgsl_rng_default_seed
- type(fgsl_qrng_type), parameter, public fgsl::fgsl_qrng_niederreiter_2 = fgsl_qrng_type(1)
- type(fgsl_qrng_type), parameter, public fgsl::fgsl_qrng_sobol = fgsl_qrng_type(2)
- type(fgsl_qrng_type), parameter, public fgsl::fgsl_qrng_halton = fgsl_qrng_type(3)
- type(fgsl_qrng_type), parameter, public fgsl::fgsl_qrng_reversehalton = fgsl_qrng_type(4)
- integer(c_int), parameter, public fgsl::fgsl_vegas_mode_importance = 1

- integer(c_int), parameter, public fgsl::fgsl_vegas_mode_importance_only = 0
- integer(c_int), parameter, public fgsl::fgsl_vegas_mode_stratified = -1
- type(fgsl_odeiv2_step_type), parameter, public fgsl::fgsl_odeiv2_step_rk2 = fgsl_odeiv2_step_type(1)
- type(fgsl_odeiv2_step_type), parameter, public fgsl::fgsl_odeiv2_step_rk4 = fgsl_odeiv2_step_type(2)
- type(fgsl_odeiv2_step_type), parameter, public fgsl::fgsl_odeiv2_step_rkf45 = fgsl_odeiv2_step_type(3)
- type(fgsl_odeiv2_step_type), parameter, public fgsl::fgsl_odeiv2_step_rkck = fgsl_odeiv2_step_type(4)
- type(fgsl_odeiv2_step_type), parameter, public fgsl::fgsl_odeiv2_step_rk8pd = fgsl_odeiv2_step_type(5)
- type(fgsl_odeiv2_step_type), parameter, public fgsl::fgsl_odeiv2_step_rk1imp = fgsl_odeiv2_step_type(6)
- type(fgsl_odeiv2_step_type), parameter, public fgsl::fgsl_odeiv2_step_rk2imp = fgsl_odeiv2_step_type(7)
- type(fgsl_odeiv2_step_type), parameter, public fgsl::fgsl_odeiv2_step_rk4imp = fgsl_odeiv2_step_type(8)
- type(fgsl_odeiv2_step_type), parameter, public fgsl::fgsl_odeiv2_step_bsimp = fgsl_odeiv2_step_type(9)
- type(fgsl_odeiv2_step_type), parameter, public fgsl::fgsl_odeiv2_step_msadams = fgsl_odeiv2_step_type(10)
- type(fgsl_odeiv2_step_type), parameter, public fgsl::fgsl_odeiv2_step_msbdf = fgsl_odeiv2_step_type(11)
- type(fgsl_odeiv_step_type), parameter, public fgsl::fgsl_odeiv_step_rk2 = fgsl_odeiv_step_type(1)
- type(fgsl_odeiv_step_type), parameter, public fgsl::fgsl_odeiv_step_rk4 = fgsl_odeiv_step_type(2)
- type(fgsl_odeiv_step_type), parameter, public fgsl::fgsl_odeiv_step_rkf45 = fgsl_odeiv_step_type(3)
- type(fgsl_odeiv_step_type), parameter, public fgsl::fgsl_odeiv_step_rkck = fgsl_odeiv_step_type(4)
- type(fgsl_odeiv_step_type), parameter, public fgsl::fgsl_odeiv_step_rk8pd = fgsl_odeiv_step_type(5)
- type(fgsl_odeiv_step_type), parameter, public fgsl::fgsl_odeiv_step_rk2imp = fgsl_odeiv_step_type(6)
- type(fgsl_odeiv_step_type), parameter, public fgsl::fgsl_odeiv_step_rk2simp = fgsl_odeiv_step_type(7)
- type(fgsl_odeiv_step_type), parameter, public fgsl::fgsl_odeiv_step_rk4imp = fgsl_odeiv_step_type(8)
- type(fgsl_odeiv_step_type), parameter, public fgsl::fgsl_odeiv_step_bsimp = fgsl_odeiv_step_type(9)
- type(fgsl_odeiv_step_type), parameter, public fgsl::fgsl_odeiv_step_gear1 = fgsl_odeiv_step_type(10)
- type(fgsl_odeiv_step_type), parameter, public fgsl::fgsl_odeiv_step_gear2 = fgsl_odeiv_step_type(11)
- integer(fgsl_int), parameter, public fgsl::fgsl_odeiv_hadj_inc = 1
- integer(fgsl_int), parameter, public fgsl::fgsl_odeiv_hadj_nil = 0
- integer(fgsl_int), parameter, public fgsl::fgsl_odeiv_hadj_dec = -1
- type(fgsl_wavelet_type), parameter, public fgsl::fgsl_wavelet_daubechies = fgsl_wavelet_type(1)
- type(fgsl_wavelet_type), parameter, public fgsl::fgsl_wavelet_daubechies_centered = fgsl_wavelet_type(2)
- type(fgsl_wavelet_type), parameter, public fgsl::fgsl_wavelet_haar = fgsl_wavelet_type(3)
- type(fgsl_wavelet_type), parameter, public fgsl::fgsl_wavelet_haar_centered = fgsl_wavelet_type(4)
- type(fgsl_wavelet_type), parameter, public fgsl::fgsl_wavelet_bspline = fgsl_wavelet_type(5)
- type(fgsl_wavelet_type), parameter, public fgsl::fgsl_wavelet_bspline_centered = fgsl_wavelet_type(6)
- type(fgsl_root_fsolver_type), parameter, public fgsl::fgsl_root_fsolver_bisection = fgsl_root_fsolver_type(1)
- type(fgsl_root_fsolver_type), parameter, public fgsl::fgsl_root_fsolver_brent = fgsl_root_fsolver_type(2)
- type(fgsl_root_fsolver_type), parameter, public fgsl::fgsl_root_fsolver_falsepos = fgsl_root_fsolver_type(3)
- type(fgsl_root_fdfsolver_type), parameter, public fgsl::fgsl_root_fdfsolver_newton = fgsl_root_fdfsolver_type(1)
- type(fgsl_root_fdfsolver_type), parameter, public fgsl::fgsl_root_fdfsolver_secant = fgsl_root_fdfsolver_type(2)
- type(fgsl_root_fdfsolver_type), parameter, public fgsl::fgsl_root_fdfsolver_steffenson = fgsl_root_fdfsolver_type(3)
- type(fgsl_min_fminimizer_type), parameter, public fgsl::fgsl_min_fminimizer_goldensection = fgsl_min_fminimizer_type(1)
- type(fgsl_min_fminimizer_type), parameter, public fgsl::fgsl_min_fminimizer_brent = fgsl_min_fminimizer_type(2)
- type(fgsl_min_fminimizer_type), parameter, public fgsl::fgsl_min_fminimizer_quad_golden = fgsl_min_fminimizer_type(3)
- type(fgsl_multiroot_fsolver_type), parameter, public fgsl::fgsl_multiroot_fsolver_dnewton = fgsl_multiroot_fsolver_type(1)
- type(fgsl_multiroot_fsolver_type), parameter, public fgsl::fgsl_multiroot_fsolver_broyden = fgsl_multiroot_fsolver_type(2)
- type(fgsl_multiroot_fsolver_type), parameter, public fgsl::fgsl_multiroot_fsolver_hybrid = fgsl_multiroot_fsolver_type(3)

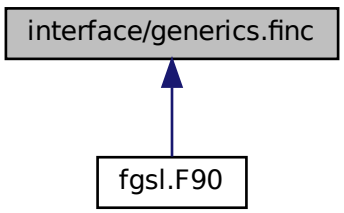
- type(fgsl_multiroot_fsolver_type), parameter, public fgsl::fgsl_multiroot_fsolver_hybrids = fgsl_multiroot_↩ fsolver_type(4)
- type(fgsl_multiroot_fdfsolver_type), parameter, public fgsl::fgsl_multiroot_fdfsolver_newton = fgsl_multiroot↩ _fdfsolver_type(1)
- type(fgsl_multiroot_fdfsolver_type), parameter, public fgsl::fgsl_multiroot_fdfsolver_gnewton = fgsl_↩ multiroot_fdfsolver_type(2)
- type(fgsl_multiroot_fdfsolver_type), parameter, public fgsl::fgsl_multiroot_fdfsolver_hybridj = fgsl_multiroot↩ _fdfsolver_type(3)
- type(fgsl_multiroot_fdfsolver_type), parameter, public fgsl::fgsl_multiroot_fdfsolver_hybridsj = fgsl_↩ multiroot_fdfsolver_type(4)
- type(fgsl_multimin_fminimizer_type), parameter, public fgsl::fgsl_multimin_fminimizer_nmsimplex = fgsl_↩ multimin_fminimizer_type(1)
- type(fgsl_multimin_fminimizer_type), parameter, public fgsl::fgsl_multimin_fminimizer_nmsimplex2 = fgsl_↩ multimin_fminimizer_type(2)
- type(fgsl_multimin_fminimizer_type), parameter, public fgsl::fgsl_multimin_fminimizer_nmsimplex2rand = fgsl_multimin_fminimizer_type(3)
- type(fgsl_multimin_fdfminimizer_type), parameter, public fgsl::fgsl_multimin_fdfminimizer_steepest_descent = fgsl_multimin_fdfminimizer_type(1)
- type(fgsl_multimin_fdfminimizer_type), parameter, public fgsl::fgsl_multimin_fdfminimizer_conjugate_pr = fgsl_multimin_fdfminimizer_type(2)
- type(fgsl_multimin_fdfminimizer_type), parameter, public fgsl::fgsl_multimin_fdfminimizer_conjugate_fr = fgsl_multimin_fdfminimizer_type(3)
- type(fgsl_multimin_fdfminimizer_type), parameter, public fgsl::fgsl_multimin_fdfminimizer_vector_bfgs = fgsl_multimin_fdfminimizer_type(4)
- type(fgsl_multimin_fdfminimizer_type), parameter, public fgsl::fgsl_multimin_fdfminimizer_vector_bfgs2 = fgsl_multimin_fdfminimizer_type(5)
- type(fgsl_multifit_nlinear_trs), parameter, public fgsl::fgsl_multifit_nlinear_trs_lm = fgsl_multifit_nlinear_trs(1)
- type(fgsl_multifit_nlinear_trs), parameter, public fgsl::fgsl_multifit_nlinear_trs_lmaccel = fgsl_multifit_↩ nlinear_trs(2)
- type(fgsl_multifit_nlinear_trs), parameter, public fgsl::fgsl_multifit_nlinear_trs_dogleg = fgsl_multifit_nlinear↩ _trs(3)
- type(fgsl_multifit_nlinear_trs), parameter, public fgsl::fgsl_multifit_nlinear_trs_ddogleg = fgsl_multifit_↩ nlinear_trs(4)
- type(fgsl_multifit_nlinear_trs), parameter, public fgsl::fgsl_multifit_nlinear_trs_subspace2d = fgsl_multifit_↩ nlinear_trs(5)
- type(fgsl_multilarge_nlinear_trs), parameter, public fgsl::fgsl_multilarge_nlinear_trs_lm = fgsl_multilarge_↩ nlinear_trs(1)
- type(fgsl_multilarge_nlinear_trs), parameter, public fgsl::fgsl_multilarge_nlinear_trs_lmaccel = fgsl_↩ multilarge_nlinear_trs(2)
- type(fgsl_multilarge_nlinear_trs), parameter, public fgsl::fgsl_multilarge_nlinear_trs_dogleg = fgsl_↩ multilarge_nlinear_trs(3)
- type(fgsl_multilarge_nlinear_trs), parameter, public fgsl::fgsl_multilarge_nlinear_trs_ddogleg = fgsl_↩ multilarge_nlinear_trs(4)
- type(fgsl_multilarge_nlinear_trs), parameter, public fgsl::fgsl_multilarge_nlinear_trs_subspace2d = fgsl_↩ multilarge_nlinear_trs(5)
- type(fgsl_multilarge_nlinear_trs), parameter, public fgsl::fgsl_multilarge_nlinear_trs_cgst = fgsl_multilarge↩ _nlinear_trs(6)
- type(fgsl_multifit_nlinear_scale), parameter, public fgsl::fgsl_multifit_nlinear_scale_levenberg = fgsl_multifit↩ _nlinear_scale(1)
- type(fgsl_multifit_nlinear_scale), parameter, public fgsl::fgsl_multifit_nlinear_scale_marquardt = fgsl_↩ multifit_nlinear_scale(2)
- type(fgsl_multifit_nlinear_scale), parameter, public fgsl::fgsl_multifit_nlinear_scale_more = fgsl_multifit_↩ nlinear_scale(3)
- type(fgsl_multilarge_nlinear_scale), parameter, public fgsl::fgsl_multilarge_nlinear_scale_levenberg = fgsl↩ _multilarge_nlinear_scale(1)
- type(fgsl_multilarge_nlinear_scale), parameter, public fgsl::fgsl_multilarge_nlinear_scale_marquardt = fgsl↩ _multilarge_nlinear_scale(2)

- type(fgsl_multilarge_nlinear_scale), parameter, public fgsl::fgsl_multilarge_nlinear_scale_more = fgsl_↩ multilarge_nlinear_scale(3)
- type(fgsl_multifit_nlinear_solver), parameter, public fgsl::fgsl_multifit_nlinear_solver_cholesky = fgsl_↩ multifit_nlinear_solver(1)
- type(fgsl_multifit_nlinear_solver), parameter, public fgsl::fgsl_multifit_nlinear_solver_qr = fgsl_multifit_↩ nlinear_solver(2)
- type(fgsl_multifit_nlinear_solver), parameter, public fgsl::fgsl_multifit_nlinear_solver_svd = fgsl_multifit_↩ nlinear_solver(3)
- integer(fgsl_int), parameter, public fgsl::fgsl_multifit_nlinear_fwdiff = 0
- integer(fgsl_int), parameter, public fgsl::fgsl_multifit_nlinear_ctrdiff = 1
- type(fgsl_multilarge_nlinear_solver), parameter, public fgsl::fgsl_multilarge_nlinear_solver_cholesky = fgsl↩ _multilarge_nlinear_solver(1)
- type(fgsl_multifit_fdfsolver_type), parameter, public fgsl::fgsl_multifit_fdfsolver_lmder = fgsl_multifit_↩ fdfsolver_type(1)
- type(fgsl_multifit_fdfsolver_type), parameter, public fgsl::fgsl_multifit_fdfsolver_lmsder = fgsl_multifit_↩ fdfsolver_type(2)
- type(fgsl_multifit_fdfsolver_type), parameter, public fgsl::fgsl_multifit_fdfsolver_lmniel = fgsl_multifit_↩ fdfsolver_type(3)
- integer(fgsl_size_t), parameter, public fgsl::fgsl_spmatrix_triplet = 0
- integer(fgsl_size_t), parameter, public fgsl::fgsl_spmatrix_ccs = 1
- type(fgsl_splinalg_itersolve_type), parameter, public fgsl::fgsl_splinalg_itersolve_gmres = fgsl_splinalg_↩ itersolve_type(1)
- integer(fgsl_int), parameter, public fgsl::fgsl_movstat_end_padzero = 0
- integer(fgsl_int), parameter, public fgsl::fgsl_movstat_end_padvalue = 1
- integer(fgsl_int), parameter, public fgsl::fgsl_movstat_end_truncate = 2
- integer(fgsl_int), parameter, public fgsl::fgsl_filter_end_padzero = 0

  Note: gsl_movstat_accum is not matched since the publicized interface does not make explicit use of accumulators.
- integer(fgsl_int), parameter, public fgsl::fgsl_filter_end_padvalue = 1
- integer(fgsl_int), parameter, public fgsl::fgsl_filter_end_truncate = 2
- integer(fgsl_int), parameter, public fgsl::fgsl_filter_scale_mad = 0
- integer(fgsl_int), parameter, public fgsl::fgsl_filter_scale_iqr = 1
- integer(fgsl_int), parameter, public fgsl::fgsl_filter_scale_sn = 2
- integer(fgsl_int), parameter, public fgsl::fgsl_filter_scale_qn = 3

49.44 interface/generics.finc File Reference

This graph shows which files directly or indirectly include this file:



Data Types

- interface fgsl_well_defined
- interface fgsl_multifit_nlinear_type
- interface fgsl_multilarge_nlinear_type
- interface fgsl_sizeof
- interface fgsl_obj_c_ptr
- interface assignment(=)
- interface fgsl_vector_init
- interface fgsl_vector_free
- interface fgsl_matrix_init
- interface fgsl_matrix_free
- interface fgsl_vector_to_fptr
- interface fgsl_vector_align
- interface fgsl_matrix_align
- interface fgsl_permute
- interface fgsl_permute_inverse
- interface fgsl_sort
- interface fgsl_sort_index
- interface fgsl_sort_smallest
- interface fgsl_sort_smallest_index
- interface fgsl_sort_largest
- interface fgsl_sort_largest_index
- interface fgsl_ran_shuffle
- interface fgsl_ieee_fprintf
- interface fgsl_ieee_printf
- interface fgsl_multifit_fdfsolver_dif_df
- interface fgsl_multifit_eval_wf
- interface fgsl_multifit_eval_wdf

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