SSELAB TippeTop gyro group11

1.0

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Namespace Documentation

5.1 blitz Namespace Reference

Blitz++ is a C++ class library for scientific computing.

5.1.1 Detailed Description

Blitz++ is a C++ class library for scientific computing. Blitz++ is a C++ class library for scientific computing which provides performance on par with Fortran 77/90. It uses template techniques to achieve high performance. The current versions provide dense arrays and vectors, random number generators, and small vectors and matrices.

5.2 NTL Namespace Reference

NTL (p. 9) is a high-performance, portable C++ library.

5.2.1 Detailed Description

NTL (p. 9) is a high-performance, portable C++ library. **NTL** (p. 9) is a high-performance, portable C++ library providing data structures and algorithms for manipulating signed, arbitrary length integers, and for vectors, matrices, and polynomials over the integers and over finite fields.

Chapter 6

Class Documentation

6.1 StepperDopr853m< D >::Controller Struct Reference

`#include <StepperDopr853m.h>`

Public Member Functions

- **Controller** ()
- bool **success** (RR err, RR &h, D &derivs)

Public Attributes

- RR **hnext**
- RR **errold**
- RR **G**
- Array< RR, 1 > **youtc**
- bool **reject**

template<typename D> struct StepperDopr853m< D >::Controller

6.1.1 Constructor & Destructor Documentation

6.1.1.1 template<typename D > StepperDopr853m< D >::Controller::Controller ( )

6.1.2 Member Function Documentation

6.1.2.1 template<typename D > bool StepperDopr853m< D >::Controller::success (RR *err*, RR & *h*, D & *derivs*)

Here is the call graph for this function:

6.1.3 Member Data Documentation

6.1.3.1 template<typename D > RR StepperDopr853m< D >::Controller::errold

6.1.3.2 template<typename D > RR StepperDopr853m< D >::Controller::G

6.1.3.3 template<typename D > RR StepperDopr853m< D >::Controller::hnext

6.1.3.4 template<typename D > bool StepperDopr853m< D >::Controller::reject

6.1.3.5 template<typename D > Array<RR,1> StepperDopr853m< D >::Controller::youtc

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

- **StepperDopr853m.h**

6.2 Odeint< Stepper > Class Template Reference

high-level interface for ODE solvers with adaptive steppsize controll

`#include <Odeint.h>`

Public Member Functions

- **Odeint** (Array< RR, 1 > &ystartt, const RR xx1, const RR xx2, const RR atol, const RR rtol, const RR h1, const RR hminn, **Output**< Stepper > &outt, typename Stepper::Dtype &derivss)

- void **integrate** ()

Public Attributes

- RR **EPS**
- int **nok**
- int **nbad**
- int **nvar**
- RR **x1**
- RR **x2**
- RR **hmin**
- bool **dense**
- Array< RR, 1 > **y**
- Array< RR, 1 > **dydx**
- Array< RR, 1 > & **ystart**
- **Output**< Stepper > & **out**
- Stepper::Dtype & **derivs**
- Stepper **s**
- int **nstp**
- RR **x**
- RR **h**

Static Public Attributes

- static const int **MAXSTP** = 5000000

6.2.1 Detailed Description

template<typename Stepper>class Odeint< Stepper >

high-level interface for ODE solvers with adaptive steppsize controll

Date

30.03.2012

Version

1.0

Author

Alexander Fischer

high-level interface for ODE solvers with adaptive steppsize controll

dependencies:

- blitz/array.h
- NTL/RR.h
- **Output.h** (p. 44)
- **RuntimeException.h** (p. 47)

called in:

- **mainwindow.cpp** (p. 39)

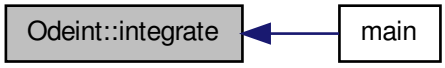
6.2.2 Constructor & Destructor Documentation

6.2.2.1 template<typename Stepper > Odeint< Stepper >::Odeint (Array< RR, 1 > & *ystartt,* const RR *xx1,* const RR *xx2,* const RR *atol,* const RR *rtol,* const RR *h1,* const RR *hminn,* Output< Stepper > & *outt,* typename Stepper::Dtype & *derivss*)

6.2.3 Member Function Documentation

6.2.3.1 template<typename Stepper > void Odeint< Stepper >::integrate ( )

Here is the caller graph for this function:



6.2.4 Member Data Documentation

6.2.4.1 template<typename Stepper> bool Odeint< Stepper >::dense

6.2.4.2 template<typename Stepper> Stepper::Dtype& Odeint< Stepper >::derivs

6.2.4.3 template<typename Stepper> Array<RR,1> Odeint< Stepper >::dydx

6.2.4.4 template<typename Stepper> RR Odeint< Stepper >::EPS

6.2.4.5 template<typename Stepper> RR Odeint< Stepper >::h

6.2.4.6 template<typename Stepper> RR Odeint< Stepper >::hmin

6.2.4.7 template<typename Stepper> const int Odeint< Stepper >::MAXSTP = 5000000 [static]

6.2.4.8 template<typename Stepper> int Odeint< Stepper >::nbad

6.2.4.9 template<typename Stepper> int Odeint< Stepper >::nok

6.2.4.10 template<typename Stepper> int Odeint< Stepper >::nstp

6.2.4.11 template<typename Stepper> int Odeint< Stepper >::nvar

6.2.4.12 template<typename Stepper> Output<Stepper>& Odeint< Stepper >::out

6.2.4.13 template<typename Stepper> Stepper Odeint< Stepper >::s

6.2.4.14 template<typename Stepper> RR Odeint< Stepper >::x

6.2.4.15 template<typename Stepper> RR Odeint< Stepper >::x1

6.2.4.16 template<typename Stepper> RR Odeint< Stepper >::x2

6.2.4.17 template<typename Stepper> Array<RR,1> Odeint< Stepper >::y

6.2.4.18 template<typename Stepper> Array<RR,1>& Odeint< Stepper >::ystart

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

- **Odeint.h**

6.3 Output< Stepper > Class Template Reference

structure for output from ODE solver such as odeint

`#include <Output.h>`

Public Member Functions

- **Output** ()

- **Output** (const int nsavee)
- void **init** (const int neqn, const RR xlo, const RR xhi)
- void **resize** ()
- void **clear** ()
- void **save_dense** (Stepper &s, const RR **xout**, const RR h)
- void **save** (const RR x, Array< RR, 1 > &y)
- void **out** (const int nstp, const RR x, Array< RR, 1 > &y, Stepper &s, const RR h)
- void **exportfile** (const char *filename)
- void **importfile** (const char *filename)

Public Attributes

- int **kmax**
- int **nvar**
- int **nsave**
- bool **dense**
- int **count**
- RR **x1**
- RR **x2**
- RR **xout**
- RR **dxout**
- Array< RR, 1 > **xsave**
- Array< RR, 2 > **ysave**

6.3.1 Detailed Description

template<typename Stepper>class Output< Stepper >

structure for output from ODE solver such as odeint

Date

30.03.2012

Author

Alexander Fischer

Version

1.0

structure for output from ODE solver such as odeint

dependencies:

- blitz/array.h
- NTL/RR.h
- **RuntimeException.h** (p. 47)

called in:

- **mainwindow.cpp** (p. 39)

6.3.2 Constructor & Destructor Documentation

6.3.2.1 template<typename Stepper > Output< Stepper >::Output ( )

6.3.2.2 template<typename Stepper > Output< Stepper >::Output (const int *nsavee*)

6.3.3 Member Function Documentation

6.3.3.1 template<typename Stepper > void Output< Stepper >::clear ( )

6.3.3.2 template<typename Stepper > void Output< Stepper >::exportfile (const char * *filename*)

6.3.3.3 template<typename Stepper > void Output< Stepper >::importfile (const char * *filename*)

6.3.3.4 template<typename Stepper > void Output< Stepper >::init (const int *neqn,* const RR *xlo,* const RR *xhi*)

6.3.3.5 template<typename Stepper > void Output< Stepper >::out (const int *nstp,* const RR *x,* Array< RR, 1 > & *y,* Stepper & *s,* const RR *h*)

6.3.3.6 template<typename Stepper > void Output< Stepper >::resize ( )

6.3.3.7 template<typename Stepper > void Output< Stepper >::save (const RR *x,* Array< RR, 1 > & *y*)

6.3.3.8 template<typename Stepper > void Output< Stepper >::save_dense (Stepper & *s,* const RR *xout,* const RR *h*)

6.3.4 Member Data Documentation

6.3.4.1 template<typename Stepper> int Output< Stepper >::count

6.3.4.2 template<typename Stepper> bool Output< Stepper >::dense

6.3.4.3 template<typename Stepper> RR Output< Stepper >::dxout

6.3.4.4 template<typename Stepper> int Output< Stepper >::kmax

6.3.4.5 template<typename Stepper> int Output< Stepper >::nsave

6.3.4.6 template<typename Stepper> int Output< Stepper >::nvar

6.3.4.7 template<typename Stepper> RR Output< Stepper >::x1

6.3.4.8 template<typename Stepper> RR Output< Stepper >::x2

6.3.4.9 template<typename Stepper> RR Output< Stepper >::xout

6.3.4.10 template<typename Stepper> Array<RR,1> Output< Stepper >::xsave

6.3.4.11 template<typename Stepper> Array<RR,2> Output< Stepper >::ysave

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

- **Output.h**

6.4 RHS_gyro Class Reference

Right-side of the "TippeTop" ODE system.

`#include <RHS_gyro.h>`

Public Member Functions

- **RHS_gyro** (RR gg, RR RRR, RR kk, RR mm, RR aa)
- void **operator()** (const RR x, Array< RR, 1 > &y, Array< RR, 1 > &dydx)
- RR **presQ** (Array< RR, 1 > &y)

Public Attributes

- RR **g**
- RR **R**
- RR **k**
- RR **m**
- RR **a**
- RR **I**
- RR **I3**

6.4.1 Detailed Description

Right-side of the "TippeTop" ODE system.

Date

04.04.2012

Version

1.0

Author

Alexander Fischer

Right-side of the "TippeTop" ODE system

dependencies:

- blitz/array.h
- NTL/RR.h

called in:

- **mainwindow.cpp** (p. 39)

6.4.2 Constructor & Destructor Documentation

6.4.2.1 RHS_gyro::RHS_gyro (RR *gg,* RR *RRR,* RR *kk,* RR *mm,* RR *aa*) [inline]

6.4.3 Member Function Documentation

6.4.3.1 void RHS_gyro::operator() (const RR *x,* Array< RR, 1 > & *y,* Array< RR, 1 > & *dydx*) [inline]

6.4.3.2 RR RHS_gyro::presQ (Array< RR, 1 > & *y*) [inline]

6.4.4 Member Data Documentation

6.4.4.1 RR RHS_gyro::a

6.4.4.2 RR RHS_gyro::g

6.4.4.3 RR RHS_gyro::I

6.4.4.4 RR RHS_gyro::I3

6.4.4.5 RR RHS_gyro::k

6.4.4.6 RR RHS_gyro::m

6.4.4.7 RR RHS_gyro::R

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

- **RHS_gyro.h**

6.5 RuntimeException Class Reference

Default exception class.

`#include <RuntimeException.h>`

Public Member Functions

- **RuntimeException** (const char *errormsgg, int windowIdd)
- const char * **what** ()
- int **getWindowId** ()

6.5.1 Detailed Description

Default exception class.

Date

10.04.2012

Version

1.0 Alexander Fischer

Default exception class

dependencies:

- std::exception

called in:

- **mainwindow.cpp** (p. 39)
- **Odeint.h** (p. 15)
- **StepperDopr853m.h** (p. 50)

6.5.2 Constructor & Destructor Documentation

6.5.2.1 RuntimeException::RuntimeException (const char * *errormsgg,* int *windowIdd*)

6.5.3 Member Function Documentation

6.5.3.1 int RuntimeException::getWindowId ( )

6.5.3.2 const char * RuntimeException::what ( )

Here is the caller graph for this function:

The documentation for this class was generated from the following files:

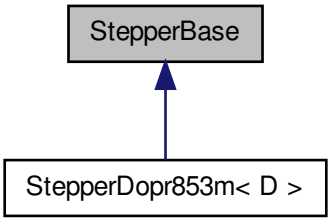
- **RuntimeException.h**
- **RuntimeException.cpp**

6.6 StepperBase Class Reference

base class for all ODE algorithms

`#include <StepperBase.h>`

Inheritance diagram for StepperBase:



Public Member Functions

- **StepperBase** (Array< RR, 1 > &yy, Array< RR, 1 > &dydxx, RR &xx, const RR atoll, const RR rtoll, bool dens)

Public Attributes

- RR & **x**
- RR **xold**
- Array< RR, 1 > & **y**
- Array< RR, 1 > & **dydx**
- RR **atol**
- RR **rtol**
- bool **dense**
- RR **hdid**
- RR **hnext**
- RR **EPS**
- int **n**
- int **neqn**
- Array< RR, 1 > **yout**
- Array< RR, 1 > **yerr**

6.6.1 Detailed Description

base class for all ODE algorithms

Date

30.03.2012

Version

0.1

Author

Alexander Fischer

base class for all ODE algorithms

dependencies:

- blitz/array.h
- NTL/RR.h

called in:

- **StepperDopr853m.h** (p. 50)

6.6.2 Constructor & Destructor Documentation

6.6.2.1 StepperBase::StepperBase (Array< RR, 1 > & *yy,* Array< RR, 1 > & *dydxx,* RR & *xx,* const RR *atoll,* const RR *rtoll,* bool *dens*)

6.6.3 Member Data Documentation

6.6.3.1 RR StepperBase::atol

6.6.3.2 bool StepperBase::dense

6.6.3.3 Array<RR,1> & StepperBase::dydx

6.6.3.4 RR StepperBase::EPS

6.6.3.5 RR StepperBase::hdid

6.6.3.6 RR StepperBase::hnext

6.6.3.7 int StepperBase::n

6.6.3.8 int StepperBase::neqn

6.6.3.9 RR StepperBase::rtol

6.6.3.10 RR& StepperBase::x

6.6.3.11 RR StepperBase::xold

6.6.3.12 Array<RR,1>& StepperBase::y

6.6.3.13 Array<RR,1> StepperBase::yerr

6.6.3.14 Array<RR,1> StepperBase::yout

The documentation for this class was generated from the following files:

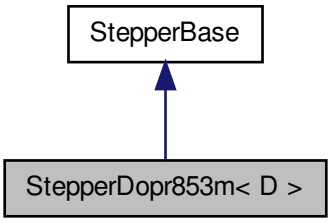
- **StepperBase.h**
- **StepperBase.cpp**

6.7 StepperDopr853m< D > Class Template Reference

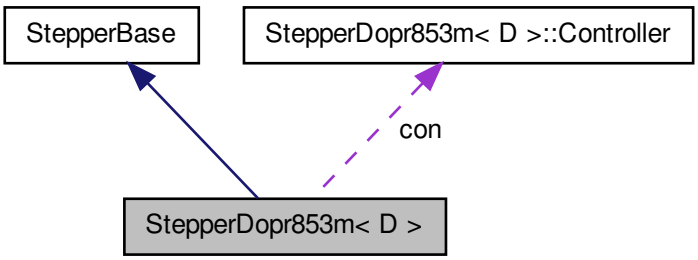
Dormant-Prince 853 method, modified to check preserved quantity.

`#include <StepperDopr853m.h>`

Inheritance diagram for StepperDopr853m< D >:



Collaboration diagram for StepperDopr853m< D >:



Classes

- struct **Controller**

Public Types

- typedef D **Dtype**

Public Member Functions

- **StepperDopr853m** (Array< RR, 1 > &yy, Array< RR, 1 > &dydxx, RR &xx, RR atoll, RR rtoll, bool dens)
- void **step** (RR htry, D &derivs)
- void **dy** (RR h, D &derivs)
- void **prepare_dense** (RR h, Array< RR, 1 > &dydxnew, D &derivs)
- RR **dense_out** (int i, RR **x**, RR h)
- RR **error** (RR h)

Public Attributes

- Array< RR, 1 > **yerr2**
- Array< RR, 1 > **ytemp**
- Array< RR, 1 > **k2**
- Array< RR, 1 > **k3**
- Array< RR, 1 > **k4**
- Array< RR, 1 > **k5**
- Array< RR, 1 > **k6**

- Array< RR, 1 > **k7**
- Array< RR, 1 > **k8**
- Array< RR, 1 > **k9**
- Array< RR, 1 > **k10**
- Array< RR, 1 > **rcont1**
- Array< RR, 1 > **rcont2**
- Array< RR, 1 > **rcont3**
- Array< RR, 1 > **rcont4**
- Array< RR, 1 > **rcont5**
- Array< RR, 1 > **rcont6**
- Array< RR, 1 > **rcont7**
- Array< RR, 1 > **rcont8**
- RR **c2**
- RR **c3**
- RR **c4**
- RR **c5**
- RR **c6**
- RR **c7**
- RR **c8**
- RR **c9**
- RR **c10**
- RR **c11**
- RR **c14**
- RR **c15**
- RR **c16**
- RR **b1**
- RR **b6**
- RR **b7**
- RR **b8**
- RR **b9**
- RR **b10**
- RR **b11**
- RR **b12**
- RR **bhh1**
- RR **bhh2**
- RR **bhh3**
- RR **er1**
- RR **er6**
- RR **er7**
- RR **er8**
- RR **er9**
- RR **er10**
- RR **er11**
- RR **er12**
- RR **a21**
- RR **a31**

- RR **a32**
- RR **a41**
- RR **a43**
- RR **a51**
- RR **a53**
- RR **a54**
- RR **a61**
- RR **a64**
- RR **a65**
- RR **a71**
- RR **a74**
- RR **a75**
- RR **a76**
- RR **a81**
- RR **a84**
- RR **a85**
- RR **a86**
- RR **a87**
- RR **a91**
- RR **a94**
- RR **a95**
- RR **a96**
- RR **a97**
- RR **a98**
- RR **a101**
- RR **a104**
- RR **a105**
- RR **a106**
- RR **a107**
- RR **a108**
- RR **a109**
- RR **a111**
- RR **a114**
- RR **a115**
- RR **a116**
- RR **a117**
- RR **a118**
- RR **a119**
- RR **a1110**
- RR **a121**
- RR **a124**
- RR **a125**
- RR **a126**
- RR **a127**
- RR **a128**
- RR **a129**

- RR **a1210**
- RR **a1211**
- RR **a141**
- RR **a147**
- RR **a148**
- RR **a149**
- RR **a1410**
- RR **a1411**
- RR **a1412**
- RR **a1413**
- RR **a151**
- RR **a156**
- RR **a157**
- RR **a158**
- RR **a1511**
- RR **a1512**
- RR **a1513**
- RR **a1514**
- RR **a161**
- RR **a166**
- RR **a167**
- RR **a168**
- RR **a169**
- RR **a1613**
- RR **a1614**
- RR **a1615**
- RR **d41**
- RR **d46**
- RR **d47**
- RR **d48**
- RR **d49**
- RR **d410**
- RR **d411**
- RR **d412**
- RR **d413**
- RR **d414**
- RR **d415**
- RR **d416**
- RR **d51**
- RR **d56**
- RR **d57**
- RR **d58**
- RR **d59**
- RR **d510**
- RR **d511**
- RR **d512**

- RR **d513**
- RR **d514**
- RR **d515**
- RR **d516**
- RR **d61**
- RR **d66**
- RR **d67**
- RR **d68**
- RR **d69**
- RR **d610**
- RR **d611**
- RR **d612**
- RR **d613**
- RR **d614**
- RR **d615**
- RR **d616**
- RR **d71**
- RR **d76**
- RR **d77**
- RR **d78**
- RR **d79**
- RR **d710**
- RR **d711**
- RR **d712**
- RR **d713**
- RR **d714**
- RR **d715**
- RR **d716**
- **Controller con**

6.7.1 Detailed Description

template<typename D>class StepperDopr853m< D >

Dormant-Prince 853 method, modified to check preserved quantity.

Date

02.04.2012

Version

1.1

Author

Alexander Fischer

Dormant-Prince 853 method, modified to check preserved quantity

dependencies:

- blitz/array.h
- NTL/RR.h
- **ntl_ext.h** (p. 40)
- **StepperBase.h** (p. 49)
- **RuntimeException.h** (p. 47)

called in:

- **Odeint.h** (p. 15)

6.7.2 Member Typedef Documentation

6.7.2.1 template<typename D > typedef D StepperDopr853m< D >::Dtype

6.7.3 Constructor & Destructor Documentation

6.7.3.1 template<typename D > StepperDopr853m< D >::StepperDopr853m (Array< RR, 1 > & *yy*, Array< RR, 1 > & *dydxx*, RR & *xx*, RR *atoll*, RR *rtoll*, bool *dens*)

6.7.4 Member Function Documentation

6.7.4.1 template<typename D > RR StepperDopr853m< D >::dense_out (int *i*, RR *x*, RR *h*)

6.7.4.2 template<typename D > void StepperDopr853m< D >::dy (RR *h*, D & *derivs*)

6.7.4.3 template<typename D > RR StepperDopr853m< D >::error (RR *h*)

Here is the call graph for this function:

6.7.4.4 template<typename D > void StepperDopr853m< D >::prepare_dense (RR *h,* Array< RR, 1 > & *dydxnew,* D & *derivs*)

6.7.4.5 template<typename D > void StepperDopr853m< D >::step (RR *htry,* D & *derivs*)

6.7.5 Member Data Documentation

6.7.5.1 template<typename D > RR StepperDopr853m< D >::a101

6.7.5.2 template<typename D > RR StepperDopr853m< D >::a104

6.7.5.3 template<typename D > RR StepperDopr853m< D >::a105

6.7.5.4 template<typename D > RR StepperDopr853m< D >::a106

6.7.5.5 template<typename D > RR StepperDopr853m< D >::a107

6.7.5.6 template<typename D > RR StepperDopr853m< D >::a108

6.7.5.7 template<typename D > RR StepperDopr853m< D >::a109

6.7.5.8 template<typename D > RR StepperDopr853m< D >::a111

6.7.5.9 template<typename D > RR StepperDopr853m< D >::a1110

6.7.5.10 template<typename D > RR StepperDopr853m< D >::a114

6.7.5.11 template<typename D > RR StepperDopr853m< D >::a115

6.7.5.12 template<typename D > RR StepperDopr853m< D >::a116

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6.7.5.16 template<typename D > RR StepperDopr853m< D >::a121

6.7.5.17 template<typename D > RR StepperDopr853m< D >::a1210

6.7.5.18 template<typename D > RR StepperDopr853m< D >::a1211

6.7.5.19 template<typename D > RR StepperDopr853m< D >::a124

6.7.5.20 template<typename D > RR StepperDopr853m< D >::a125

6.7.5.21 template<typename D > RR StepperDopr853m< D >::a126

6.7.5.22 template<typename D > RR StepperDopr853m< D >::a127

6.7.5.23 template<typename D > RR StepperDopr853m< D >::a128

6.7.5.24 template<typename D > RR StepperDopr853m< D >::a129

6.7.5.25 template<typename D > RR StepperDopr853m< D >::a141

6.7.5.26 template<typename D > RR StepperDopr853m< D >::a1410

6.7.5.27 template<typename D > RR StepperDopr853m< D >::a1411

6.7.5.28 template<typename D > RR StepperDopr853m< D >::a1412

6.7.5.29 template<typename D > RR StepperDopr853m< D >::a1413

6.7.5.30 template<typename D > RR StepperDopr853m< D >::a147

6.7.5.31 template<typename D > RR StepperDopr853m< D >::a148

6.7.5.32 template<typename D > RR StepperDopr853m< D >::a149

6.7.5.33 template<typename D > RR StepperDopr853m< D >::a151

6.7.5.34 template<typename D > RR StepperDopr853m< D >::a1511

6.7.5.35 template<typename D > RR StepperDopr853m< D >::a1512

6.7.5.36 template<typename D > RR StepperDopr853m< D >::a1513

6.7.5.37 template<typename D > RR StepperDopr853m< D >::a1514

6.7.5.38 template<typename D > RR StepperDopr853m< D >::a156

6.7.5.39 template<typename D > RR StepperDopr853m< D >::a157

6.7.5.40 template<typename D > RR StepperDopr853m< D >::a158

6.7.5.41 template<typename D > RR StepperDopr853m< D >::a161

6.7.5.42 template<typename D > RR StepperDopr853m< D >::a1613

6.7.5.43 template<typename D > RR StepperDopr853m< D >::a1614

6.7.5.44 template<typename D > RR StepperDopr853m< D >::a1615

6.7.5.45 template<typename D > RR StepperDopr853m< D >::a166

6.7.5.46 template<typename D > RR StepperDopr853m< D >::a167

6.7.5.47 template<typename D > RR StepperDopr853m< D >::a168

6.7.5.48 template<typename D > RR StepperDopr853m< D >::a169

6.7.5.49 template<typename D > RR StepperDopr853m< D >::a21

6.7.5.50 template<typename D > RR StepperDopr853m< D >::a31

6.7.5.51 template<typename D > RR StepperDopr853m< D >::a32

6.7.5.52 template<typename D > RR StepperDopr853m< D >::a41

6.7.5.53 template<typename D > RR StepperDopr853m< D >::a43

6.7.5.54 template<typename D > RR StepperDopr853m< D >::a51

6.7.5.55 template<typename D > RR StepperDopr853m< D >::a53

6.7.5.56 template<typename D > RR StepperDopr853m< D >::a54

6.7.5.57 template<typename D > RR StepperDopr853m< D >::a61

6.7.5.58 template<typename D > RR StepperDopr853m< D >::a64

6.7.5.59 template<typename D > RR StepperDopr853m< D >::a65

6.7.5.60 template<typename D > RR StepperDopr853m< D >::a71

6.7.5.61 template<typename D > RR StepperDopr853m< D >::a74

6.7.5.62 template<typename D > RR StepperDopr853m< D >::a75

6.7.5.63 template<typename D > RR StepperDopr853m< D >::a76

6.7.5.64 template<typename D > RR StepperDopr853m< D >::a81

6.7.5.65 template<typename D > RR StepperDopr853m< D >::a84

6.7.5.66 template<typename D > RR StepperDopr853m< D >::a85

6.7.5.67 template<typename D > RR StepperDopr853m< D >::a86

6.7.5.68 template<typename D > RR StepperDopr853m< D >::a87

6.7.5.69 template<typename D > RR StepperDopr853m< D >::a91

6.7.5.70 template<typename D > RR StepperDopr853m< D >::a94

6.7.5.71 template<typename D > RR StepperDopr853m< D >::a95

6.7.5.72 template<typename D > RR StepperDopr853m< D >::a96

6.7.5.73 template<typename D > RR StepperDopr853m< D >::a97

6.7.5.74 template<typename D > RR StepperDopr853m< D >::a98

6.7.5.75 template<typename D > RR StepperDopr853m< D >::b1

6.7.5.76 template<typename D > RR StepperDopr853m< D >::b10

6.7.5.77 template<typename D > RR StepperDopr853m< D >::b11

6.7.5.78 template<typename D > RR StepperDopr853m< D >::b12

6.7.5.79 template<typename D > RR StepperDopr853m< D >::b6

6.7.5.80 template<typename D > RR StepperDopr853m< D >::b7

6.7.5.81 template<typename D > RR StepperDopr853m< D >::b8

6.7.5.82 template<typename D > RR StepperDopr853m< D >::b9

6.7.5.83 template<typename D > RR StepperDopr853m< D >::bhh1

6.7.5.84 template<typename D > RR StepperDopr853m< D >::bhh2

6.7.5.85 template<typename D > RR StepperDopr853m< D >::bhh3

6.7.5.86 template<typename D > RR StepperDopr853m< D >::c10

6.7.5.87 template<typename D > RR StepperDopr853m< D >::c11

6.7.5.88 template<typename D > RR StepperDopr853m< D >::c14

6.7.5.89 template<typename D > RR StepperDopr853m< D >::c15

6.7.5.90 template<typename D > RR StepperDopr853m< D >::c16

6.7.5.91 template<typename D > RR StepperDopr853m< D >::c2

6.7.5.92 template<typename D > RR StepperDopr853m< D >::c3

6.7.5.93 template<typename D > RR StepperDopr853m< D >::c4

6.7.5.94 template<typename D > RR StepperDopr853m< D >::c5

6.7.5.95 template<typename D > RR StepperDopr853m< D >::c6

6.7.5.96 template<typename D > RR StepperDopr853m< D >::c7

6.7.5.97 template<typename D > RR StepperDopr853m< D >::c8

6.7.5.98 template<typename D > RR StepperDopr853m< D >::c9

6.7.5.99 template<typename D > Controller StepperDopr853m< D >::con

6.7.5.100 template<typename D > RR StepperDopr853m< D >::d41

6.7.5.101 template<typename D > RR StepperDopr853m< D >::d410

6.7.5.102 template<typename D > RR StepperDopr853m< D >::d411

6.7.5.103 template<typename D > RR StepperDopr853m< D >::d412

6.7.5.104 template<typename D > RR StepperDopr853m< D >::d413

6.7.5.105 template<typename D > RR StepperDopr853m< D >::d414

6.7.5.106 template<typename D > RR StepperDopr853m< D >::d415

6.7.5.107 template<typename D > RR StepperDopr853m< D >::d416

6.7.5.108 template<typename D > RR StepperDopr853m< D >::d46

6.7.5.109 template<typename D > RR StepperDopr853m< D >::d47

6.7.5.110 template<typename D > RR StepperDopr853m< D >::d48

6.7.5.111 template<typename D > RR StepperDopr853m< D >::d49

6.7.5.112 template<typename D > RR StepperDopr853m< D >::d51

6.7.5.113 template<typename D > RR StepperDopr853m< D >::d510

6.7.5.114 template<typename D > RR StepperDopr853m< D >::d511

6.7.5.115 template<typename D > RR StepperDopr853m< D >::d512

6.7.5.116 template<typename D > RR StepperDopr853m< D >::d513

6.7.5.117 template<typename D > RR StepperDopr853m< D >::d514

6.7.5.118 template<typename D > RR StepperDopr853m< D >::d515

6.7.5.119 template<typename D > RR StepperDopr853m< D >::d516

6.7.5.120 template<typename D > RR StepperDopr853m< D >::d56

6.7.5.121 template<typename D > RR StepperDopr853m< D >::d57

6.7.5.122 template<typename D > RR StepperDopr853m< D >::d58

6.7.5.123 template<typename D > RR StepperDopr853m< D >::d59

6.7.5.124 template<typename D > RR StepperDopr853m< D >::d61

6.7.5.125 template<typename D > RR StepperDopr853m< D >::d610

6.7.5.126 template<typename D > RR StepperDopr853m< D >::d611

6.7.5.127 template<typename D > RR StepperDopr853m< D >::d612

6.7.5.128 template<typename D > RR StepperDopr853m< D >::d613

6.7.5.129 template<typename D > RR StepperDopr853m< D >::d614

6.7.5.130 template<typename D > RR StepperDopr853m< D >::d615

6.7.5.131 template<typename D > RR StepperDopr853m< D >::d616

6.7.5.132 template<typename D > RR StepperDopr853m< D >::d66

6.7.5.133 template<typename D > RR StepperDopr853m< D >::d67

6.7.5.134 template<typename D > RR StepperDopr853m< D >::d68

6.7.5.135 template<typename D > RR StepperDopr853m< D >::d69

6.7.5.136 template<typename D > RR StepperDopr853m< D >::d71

6.7.5.137 template<typename D > RR StepperDopr853m< D >::d710

6.7.5.138 template<typename D > RR StepperDopr853m< D >::d711

6.7.5.139 template<typename D > RR StepperDopr853m< D >::d712

6.7.5.140 template<typename D > RR StepperDopr853m< D >::d713

6.7.5.141 template<typename D > RR StepperDopr853m< D >::d714

6.7.5.142 template<typename D > RR StepperDopr853m< D >::d715

6.7.5.143 template<typename D > RR StepperDopr853m< D >::d716

6.7.5.144 template<typename D > RR StepperDopr853m< D >::d76

6.7.5.145 template<typename D > RR StepperDopr853m< D >::d77

6.7.5.146 template<typename D > RR StepperDopr853m< D >::d78

6.7.5.147 template<typename D > RR StepperDopr853m< D >::d79

6.7.5.148 template<typename D > RR StepperDopr853m< D >::er1

6.7.5.149 template<typename D > RR StepperDopr853m< D >::er10

6.7.5.150 template<typename D > RR StepperDopr853m< D >::er11

6.7.5.151 template<typename D > RR StepperDopr853m< D >::er12

6.7.5.152 template<typename D > RR StepperDopr853m< D >::er6

6.7.5.153 template<typename D > RR StepperDopr853m< D >::er7

6.7.5.154 template<typename D > RR StepperDopr853m< D >::er8

6.7.5.155 template<typename D > RR StepperDopr853m< D >::er9

6.7.5.156 template<typename D > Array<RR,1> StepperDopr853m< D >::k10

6.7.5.157 template<typename D > Array<RR,1> StepperDopr853m< D >::k2

6.7.5.158 template<typename D > Array<RR,1> StepperDopr853m< D >::k3

6.7.5.159 template<typename D > Array<RR,1> StepperDopr853m< D >::k4

6.7.5.160 template<typename D > Array<RR,1> StepperDopr853m< D >::k5

6.7.5.161 template<typename D > Array<RR,1> StepperDopr853m< D >::k6

6.7.5.162 template<typename D > Array<RR,1> StepperDopr853m< D >::k7

6.7.5.163 template<typename D > Array<RR,1> StepperDopr853m< D >::k8

6.7.5.164 template<typename D > Array<RR,1> StepperDopr853m< D >::k9

6.7.5.165 template<typename D > Array<RR,1> StepperDopr853m< D >::rcont1

6.7.5.166 template<typename D > Array<RR,1> StepperDopr853m< D >::rcont2

6.7.5.167 template<typename D > Array<RR,1> StepperDopr853m< D >::rcont3

6.7.5.168 template<typename D > Array<RR,1> StepperDopr853m< D >::rcont4

6.7.5.169 template<typename D > Array<RR,1> StepperDopr853m< D >::rcont5

6.7.5.170 template<typename D > Array<RR,1> StepperDopr853m< D >::rcont6

6.7.5.171 template<typename D > Array<RR,1> StepperDopr853m< D >::rcont7

6.7.5.172 template<typename D > Array<RR,1> StepperDopr853m< D >::rcont8

6.7.5.173 template<typename D > Array<RR,1> StepperDopr853m< D >::yerr2

6.7.5.174 template<typename D > Array<RR,1> StepperDopr853m< D >::ytemp

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

- **StepperDopr853m.h**

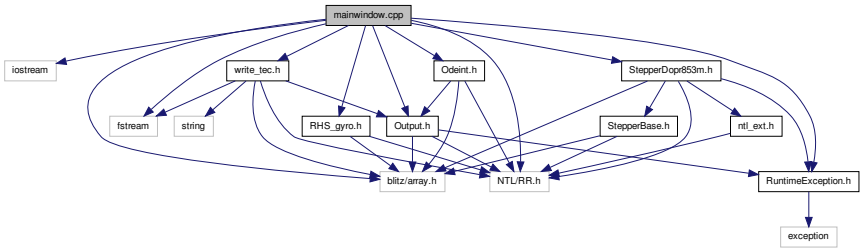
Chapter 7

File Documentation

7.1 mainwindow.cpp File Reference

```
#include <iostream> #include <fstream> #include <blitz/array.-
h> #include <NTL/RR.h> #include "Odeint.h" #include "-
Output.h" #include "RHS_gyro.h" #include "StepperDopr853m.-
h" #include "write_tec.h" #include "RuntimeException.h" ×
```

Include dependency graph for mainwindow.cpp:



Namespaces

- namespace **NTL**

  NTL *(p. 9) is a high-performance, portable C++ library.*
- namespace **blitz**

  Blitz++ is a C++ class library for scientific computing.

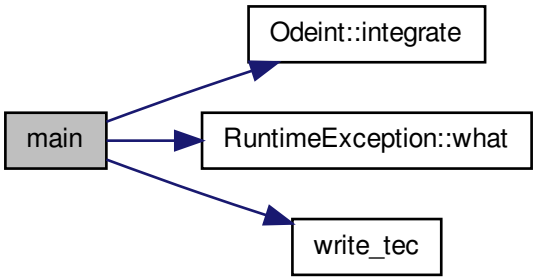
Functions

- int **main** (int argc, char ∗argv[])

7.1.1 Function Documentation

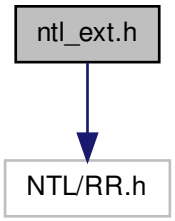
7.1.1.1 int main (int *argc,* char * *argv[]*)

Here is the call graph for this function:

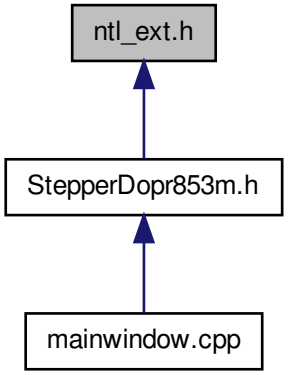


7.2 ntl_ext.h File Reference

`#include <NTL/RR.h>` Include dependency graph for ntl_ext.h:



This graph shows which files directly or indirectly include this file:



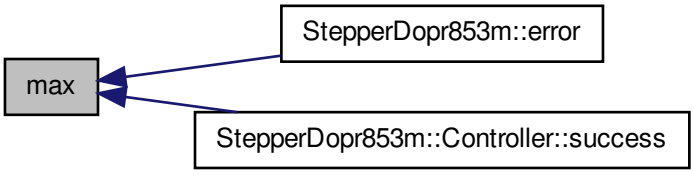
Functions

- RR **max** (RR &a, RR &b)
- RR **max** (double &a, RR &b)
- RR **max** (RR &a, double &b)
- RR **max** (RR &a, double b)
- RR **min** (RR &a, RR &b)
- RR **min** (double &a, RR &b)
- RR **min** (RR &a, double &b)
- RR **min** (RR &a, double b)

7.2.1 Function Documentation

7.2.1.1 RR max (RR & *a*, RR & *b*)

Here is the caller graph for this function:



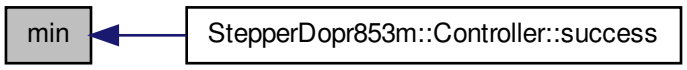
7.2.1.2 RR max (double & *a*, RR & *b*)

7.2.1.3 RR max (RR & *a*, double & *b*)

7.2.1.4 RR max (RR & *a*, double *b*)

7.2.1.5 RR min (RR & *a*, RR & *b*)

Here is the caller graph for this function:



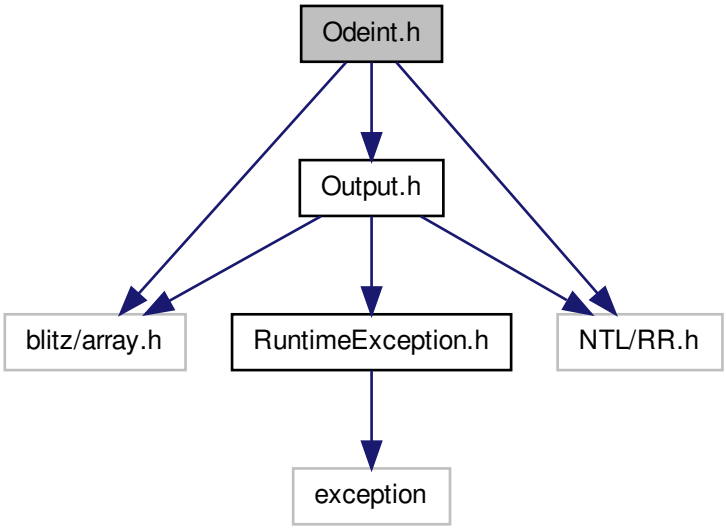
7.2.1.6 RR min (double & *a*, RR & *b*)

7.2.1.7 RR min (RR & *a*, double & *b*)

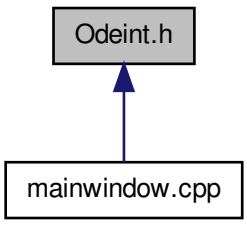
7.2.1.8 RR min (RR & *a*, double *b*)

7.3 Odeint.h File Reference

`#include <blitz/array.h> #include <NTL/RR.h> #include "-Output.h"` Include dependency graph for Odeint.h:



This graph shows which files directly or indirectly include this file:



Classes

- class **Odeint**< **Stepper** >

  high-level interface for ODE solvers with adaptive steppsize controll

Defines

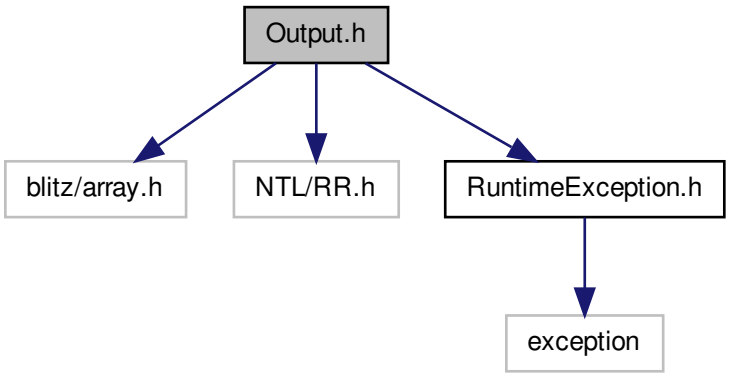
- #define **SIGN**(a, b) ((b) >= 0.0 ? fabs(a) : -fabs(a))

7.3.1 Define Documentation

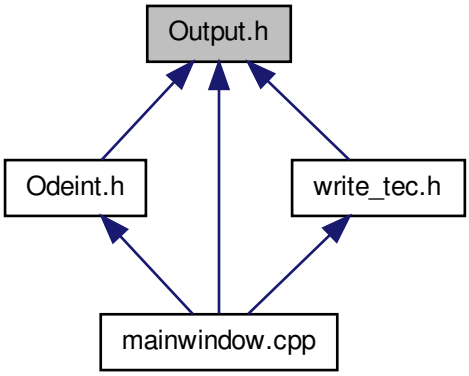
7.3.1.1 #define SIGN(*a*, *b*) ((b) >= 0.0 ? fabs(a) : -fabs(a))

7.4 Output.h File Reference

`#include <blitz/array.h> #include <NTL/RR.h> #include "-RuntimeException.h"` Include dependency graph for Output.h:



This graph shows which files directly or indirectly include this file:



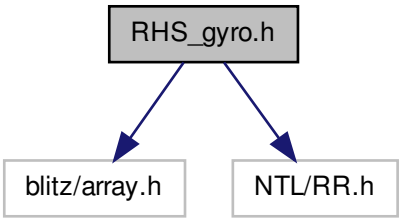
Classes

- class **Output**< **Stepper** >

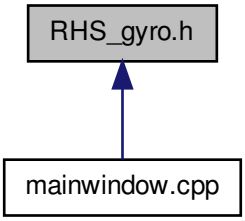
  structure for output from ODE solver such as odeint

7.5 RHS_gyro.h File Reference

`#include <blitz/array.h>` `#include <NTL/RR.h>` Include dependency graph for RHS_gyro.h:



This graph shows which files directly or indirectly include this file:



Classes

- class **RHS_gyro**

  Right-side of the "TippeTop" ODE system.

Defines

- #define **SQR**(x) ((x)∗(x))

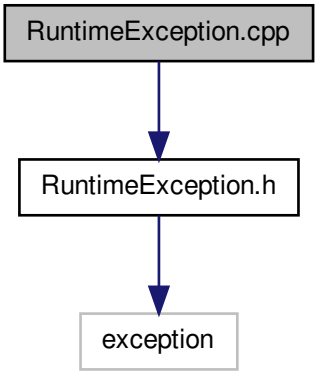
7.5.1 Define Documentation

7.5.1.1 #define SQR(*x*) ((x)∗(x))

7.6 RuntimeException.cpp File Reference

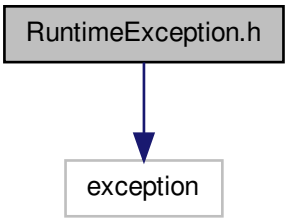
`#include "RuntimeException.h"` Include dependency graph for Runtime-

Exception.cpp:

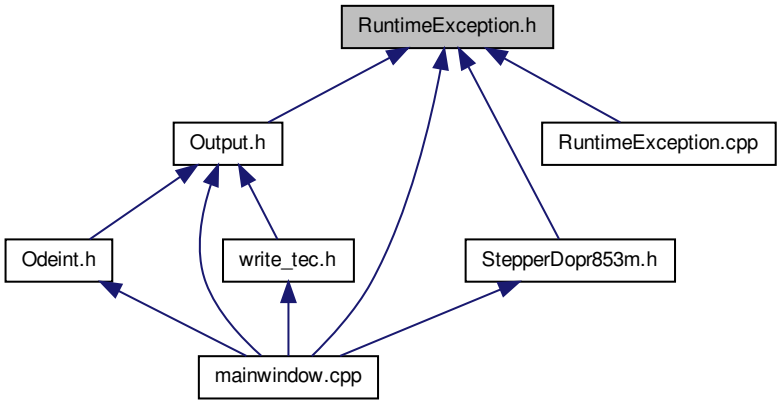


7.7 RuntimeException.h File Reference

`#include <exception>` Include dependency graph for RuntimeException.h:



This graph shows which files directly or indirectly include this file:



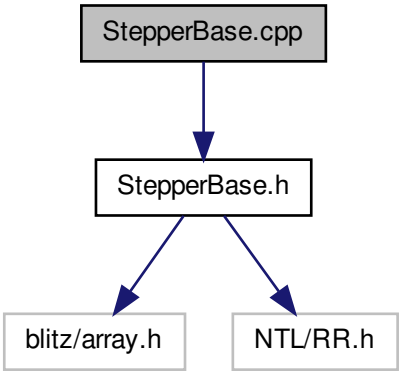
Classes

- class **RuntimeException**

  Default exception class.

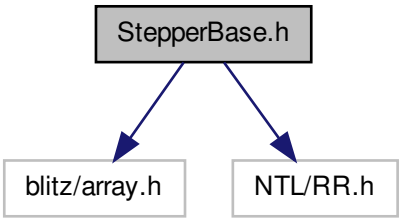
7.8 StepperBase.cpp File Reference

`#include "StepperBase.h"` Include dependency graph for StepperBase.cpp:

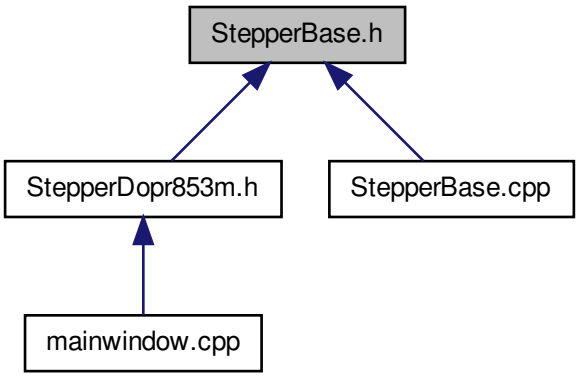


7.9 StepperBase.h File Reference

`#include <blitz/array.h>` `#include <NTL/RR.h>` Include dependency graph for StepperBase.h:



This graph shows which files directly or indirectly include this file:



Classes

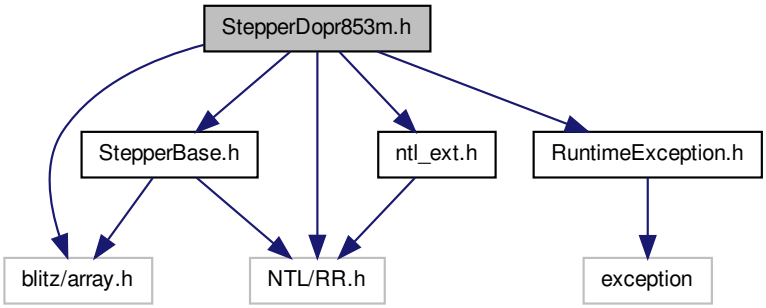
- class **StepperBase**

  base class for all ODE algorithms

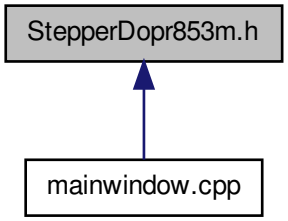
7.10 StepperDopr853m.h File Reference

```
#include <blitz/array.h>  #include <NTL/RR.h>  #include
"ntl_ext.h"  #include "StepperBase.h"  #include "Runtime-
```

Exception.h" Include dependency graph for StepperDopr853m.h:



This graph shows which files directly or indirectly include this file:



Classes

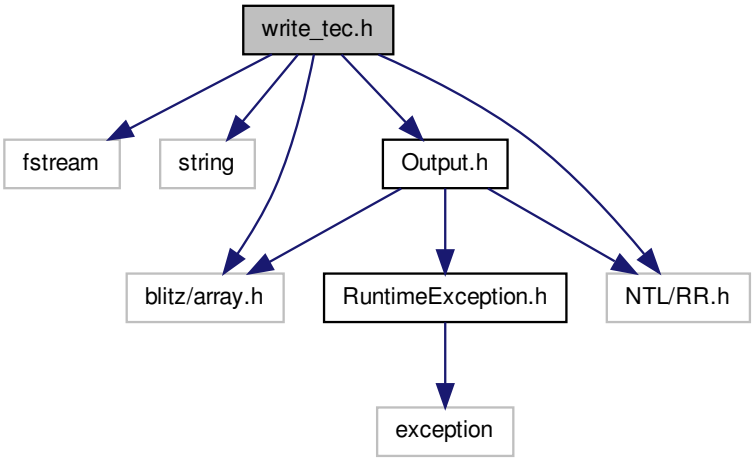
- class **StepperDopr853m< D >**

  Dormant-Prince 853 method, modified to check preserved quantity.
- struct **StepperDopr853m< D >::Controller**

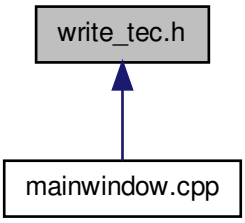
7.11 write_tec.h File Reference

#include <fstream> #include <string> #include <blitz/array.-h> #include <NTL/RR.h> #include "Output.h" Include dependency

graph for write_tec.h:



This graph shows which files directly or indirectly include this file:



Functions

- template<typename D >
  void **write_tec** (**Output**< D > &out, string s)

  write outputfile in tecplot-format

7.11.1 Function Documentation

7.11.1.1 template<typename D > void write_tec (Output< D > & *out*, string *s*)

write outputfile in tecplot-format

Date

04.04.2012

Version

0.1

Author

William Takashi Hulin

write outputfile in tecplot-format

dependencies:

- blitz/array.h
- **Output.h** (p. 44)

called in:

- **mainwindow.cpp** (p. 39)

Here is the caller graph for this function: