

Marco calling structure

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Chapter 1

Modules Index

1.1 Modules List

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Chapter 2

File Index

2.1 File List

Here is a list of all files with brief descriptions:

Marco.f90	33
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Chapter 3

Module Documentation

3.1 mg_filter_coefficients Module Reference

Variables

- integer, parameter `jnlo` =-250
- integer, parameter `jnhi` =150
- integer, parameter `ndec_jn` =15
- integer, parameter `snlo` =-112
- integer, parameter `snhi` =85
- integer, parameter `ndec_sn` =12
- integer `j9`
- real `shftjn`
- real, dimension(`jnlo:jnhi`) `wj0`
- real, dimension(`jnlo:jnhi`) `wj1`
- real, dimension(`snlo:snhi`) `wsin`
- real `delcos`
- real, dimension(-200:99) `wcos`

3.1.1 Variable Documentation

3.1.1.1 delcos

```
real mg_filter_coefficients::delcos
```

3.1.1.2 j9

```
integer mg_filter_coefficients::j9
```

3.1.1.3 jnhi

integer, parameter mg_filter_coefficients::jnhi =150

3.1.1.4 jnlo

integer, parameter mg_filter_coefficients::jnlo =-250

3.1.1.5 ndec_jn

integer, parameter mg_filter_coefficients::ndec_jn =15

3.1.1.6 ndec_sn

integer, parameter mg_filter_coefficients::ndec_sn =12

3.1.1.7 shftjn

real mg_filter_coefficients::shftjn

3.1.1.8 snhi

integer, parameter mg_filter_coefficients::snhi =85

3.1.1.9 snlo

integer, parameter mg_filter_coefficients::snlo =-112

3.1.1.10 wcos

real, dimension(-200:99) mg_filter_coefficients::wcos

3.1.1.11 wj0

```
real, dimension(jnlo:jnhi) mg_filter_coefficients::wj0
```

3.1.1.12 wj1

```
real, dimension(jnlo:jnhi) mg_filter_coefficients::wj1
```

3.1.1.13 wsin

```
real, dimension(snlo:snhi) mg_filter_coefficients::wsin
```

3.2 mg_input_routines Module Reference

Functions/Subroutines

- subroutine [read_system_data](#)
- subroutine [read_model_data](#)
- subroutine [lyth_chk](#)
- subroutine [show_model](#)
- subroutine [set_freq](#)
- subroutine [set_survey](#)
- subroutine [set_trp](#)

Variables

- integer, parameter [nprop](#) =7
- real, parameter [pi](#) =3.141592654
- integer [nr](#)
- integer [nw](#)
- integer [nd](#)
- integer [ndr](#)
- integer [nlg](#)
- integer [msg](#)
- integer [mxerr](#)
- integer [do3d](#)
- integer [tdfd](#)
- integer [step](#)
- integer [nsx](#)
- integer [prfl](#)
- integer [istop](#)
- integer [krxw](#)
- integer [nchnl](#)
- integer [nfrq](#)

- integer [source_type](#)
- integer [survey_type](#)
- integer [ntx](#)
- integer [nrxg](#)
- integer [mxvrtx](#)
- integer [mqvr](#)
- integer [j](#)
- integer [js](#)
- integer [jt](#)
- integer [jv](#)
- integer [jg](#)
- integer [jr](#)
- integer [nevents](#)
- integer [lrx](#)
- integer [mrx](#)
- integer [nlith](#)
- integer [kacc](#)
- integer [solver](#)
- integer [output](#)
- integer [npuls](#)
- integer [ntyrp](#)
- integer [ntypls](#)
- integer [ntxe](#)
- integer [kfrqe](#)
- integer, dimension(:), allocatable [n_vrtx](#)
- integer, dimension(:), allocatable [units](#)
- integer, dimension(:), allocatable [nrx](#)
- integer, dimension(:), allocatable [rx_type](#)
- integer, dimension(:), allocatable [cmp](#)
- integer, dimension(:), allocatable [nrgtx](#)
- integer, dimension(:), allocatable [nrxtx](#)
- integer, dimension(:), allocatable [txid](#)
- integer, dimension(:), allocatable [ncmpg](#)
- integer, dimension(:, :), allocatable [rgtxid](#)
- integer, dimension(:, :), allocatable [rxid](#)
- integer, dimension(:, :), allocatable [ncmp](#)
- integer, dimension(:, :), allocatable [prtcmp](#)
- real [t0sx](#)
- real [offtym](#)
- real [reftym](#)
- real [pulse](#)
- real [rxoe](#)
- real [rxon](#)
- real [rxoz](#)
- real [rxfmnt](#)
- real [maxfrq](#)
- real [minfrq](#)
- real [mxfrqe](#)
- real, dimension(:), allocatable [txon](#)
- real, dimension(:), allocatable [waveform](#)
- real, dimension(:), allocatable [curnt](#)
- real, dimension(:), allocatable [trp](#)
- real, dimension(:), allocatable [tms](#)
- real, dimension(:), allocatable [wtms](#)
- real, dimension(:), allocatable [topn](#)

- real, dimension(:), allocatable [tcls](#)
- real, dimension(:), allocatable [freq](#)
- real, dimension(:), allocatable [swx](#)
- real, dimension(:), allocatable [sxmnt](#)
- real, dimension(:), allocatable [sxdip](#)
- real, dimension(:), allocatable [sxaz](#)
- real, dimension(:, :), allocatable [swy](#)
- real, dimension(:, :), allocatable [sxe](#)
- real, dimension(:, :), allocatable [sxn](#)
- real, dimension(:, :), allocatable [sxz](#)
- real, dimension(:, :), allocatable [lyth](#)
- real, dimension(:, :), allocatable [rxdip](#)
- real, dimension(:, :), allocatable [rxaz](#)
- real, dimension(:, :), allocatable [rxmnt](#)
- real, dimension(:, :), allocatable [bhaz](#)
- real, dimension(:, :), allocatable [bhdip](#)
- real, dimension(:, :, :), allocatable [rxex](#)
- real, dimension(:, :, :), allocatable [rxn](#)
- real, dimension(:, :, :), allocatable [rxz](#)
- real(kind=8) [ecntrd](#)
- real(kind=8) [ncntrd](#)
- real(kind=8) [qd](#)
- real(kind=8), dimension(:, :), allocatable [sxed](#)
- real(kind=8), dimension(:, :), allocatable [sxnd](#)
- real(kind=8), dimension(:, :), allocatable [sxzd](#)
- real(kind=8), dimension(:, :), allocatable [clcd](#)
- real(kind=8), dimension(:, :, :), allocatable [rxed](#)
- real(kind=8), dimension(:, :, :), allocatable [rxnd](#)
- real(kind=8), dimension(:, :, :), allocatable [rxzd](#)
- logical [new](#)
- logical [prtsec](#)
- logical, dimension(:, :), allocatable [bhr](#)
- character(len=120) [inp](#)
- character(len=120) [title](#)
- integer, dimension(8) [tvals](#)
- integer [nlyr](#)
- integer [nprism](#)
- integer [ksymm](#)
- real [gnd_lvl](#)
- real, dimension(:), allocatable [thk](#)
- real, dimension(:), allocatable [res](#)
- real, dimension(:), allocatable [rmu](#)
- real, dimension(:), allocatable [reps](#)
- real, dimension(:), allocatable [chrg](#)
- real, dimension(:), allocatable [ctau](#)
- real, dimension(:), allocatable [cfreq](#)
- real, dimension(:), allocatable [lithp](#)
- integer, dimension(:), allocatable [ncell_ew](#)
- integer, dimension(:), allocatable [ncell_ns](#)
- integer, dimension(:), allocatable [ncell_z](#)
- real, dimension(:), allocatable [prsm_res](#)
- real, dimension(:), allocatable [rmup](#)
- real, dimension(:), allocatable [repsp](#)
- real, dimension(:), allocatable [prsm_chrg](#)
- real, dimension(:), allocatable [prsm_tau](#)

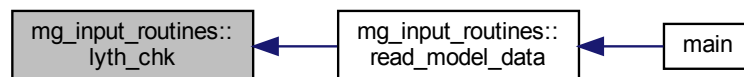
- real, dimension(:), allocatable [prsm_cfr](#)
- real, dimension(:), allocatable [prsm_size_ew](#)
- real, dimension(:), allocatable [prsm_size_ns](#)
- real, dimension(:), allocatable [prsm_size_z](#)
- real(kind=8), dimension(:), allocatable [prism_zmidd](#)
- real(kind=8), dimension(:), allocatable [prism_eastd](#)
- real(kind=8), dimension(:), allocatable [prism_northd](#)
- real, dimension(:), allocatable [prism_zmid](#)
- real, dimension(:), allocatable [prism_east](#)
- real, dimension(:), allocatable [prism_north](#)
- real [tn](#)
- real [te](#)
- integer [jb](#)
- integer [jl](#)
- integer [jp](#)
- integer, dimension(:), allocatable [lithl](#)
- integer, dimension(:), allocatable [id_lith](#)

3.2.1 Function/Subroutine Documentation

3.2.1.1 lyth_chk()

```
subroutine mg_input_routines::lyth_chk ( )
```

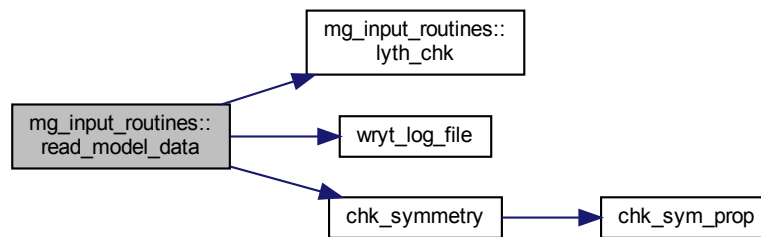
Here is the caller graph for this function:



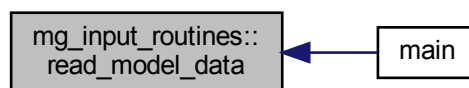
3.2.1.2 read_model_data()

```
subroutine mg_input_routines::read_model_data ( )
```

Here is the call graph for this function:



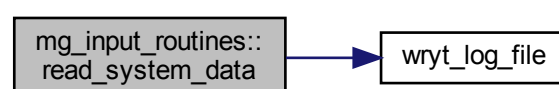
Here is the caller graph for this function:



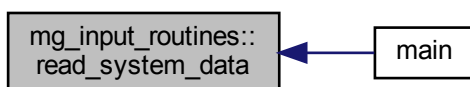
3.2.1.3 read_system_data()

```
subroutine mg_input_routines::read_system_data ( )
```

Here is the call graph for this function:



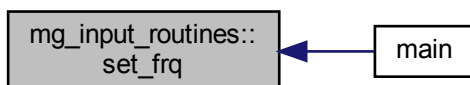
Here is the caller graph for this function:



3.2.1.4 `set_frq()`

```
subroutine mg_input_routines::set_frq ( )
```

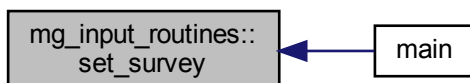
Here is the caller graph for this function:



3.2.1.5 `set_survey()`

```
subroutine mg_input_routines::set_survey ( )
```

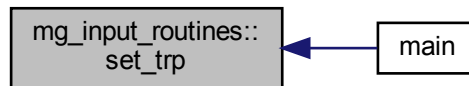
Here is the caller graph for this function:



3.2.1.6 set_trp()

```
subroutine mg_input_routines::set_trp ( )
```

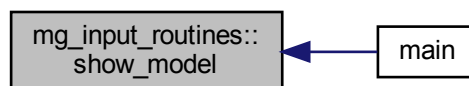
Here is the caller graph for this function:



3.2.1.7 show_model()

```
subroutine mg_input_routines::show_model ( )
```

Here is the caller graph for this function:



3.2.2 Variable Documentation

3.2.2.1 bhaz

```
real, dimension(:, :), allocatable mg_input_routines::bhaz
```

3.2.2.2 bhdip

```
real, dimension(:, :), allocatable mg_input_routines::bhdip
```

3.2.2.3 bhr

logical, dimension(:, :), allocatable mg_input_routines::bhr

3.2.2.4 cfreq

real, dimension(:), allocatable mg_input_routines::cfreq

3.2.2.5 chrg

real, dimension(:), allocatable mg_input_routines::chrg

3.2.2.6 clcd

real(kind=8), dimension(:, :), allocatable mg_input_routines::clcd

3.2.2.7 cmp

integer, dimension(:), allocatable mg_input_routines::cmp

3.2.2.8 ctau

real, dimension(:), allocatable mg_input_routines::ctau

3.2.2.9 curnt

real, dimension(:), allocatable mg_input_routines::curnt

3.2.2.10 do3d

integer mg_input_routines::do3d

3.2.2.11 ecntrd

```
real(kind=8) mg_input_routines::ecntrd
```

3.2.2.12 freq

```
real, dimension(:), allocatable mg_input_routines::freq
```

3.2.2.13 gnd_lvl

```
real mg_input_routines::gnd_lvl
```

3.2.2.14 id_lith

```
integer, dimension(:), allocatable mg_input_routines::id_lith
```

3.2.2.15 inp

```
character (len=120) mg_input_routines::inp
```

3.2.2.16 istop

```
integer mg_input_routines::istop
```

3.2.2.17 j

```
integer mg_input_routines::j
```

3.2.2.18 jb

```
integer mg_input_routines::jb
```

3.2.2.19 jg

```
integer mg_input_routines::jg
```

3.2.2.20 jl

```
integer mg_input_routines::jl
```

3.2.2.21 jp

```
integer mg_input_routines::jp
```

3.2.2.22 jr

```
integer mg_input_routines::jr
```

3.2.2.23 js

```
integer mg_input_routines::js
```

3.2.2.24 jt

```
integer mg_input_routines::jt
```

3.2.2.25 jv

```
integer mg_input_routines::jv
```

3.2.2.26 kacc

```
integer mg_input_routines::kacc
```


3.2.2.27 kfrqe

```
integer mg_input_routines::kfrqe
```

3.2.2.28 krxw

```
integer mg_input_routines::krxw
```

3.2.2.29 ksymm

```
integer mg_input_routines::ksymm
```

3.2.2.30 lithl

```
integer, dimension(:), allocatable mg_input_routines::lithl
```

3.2.2.31 lithp

```
real, dimension(:), allocatable mg_input_routines::lithp
```

3.2.2.32 lrx

```
integer mg_input_routines::lrx
```

3.2.2.33 lyth

```
real, dimension(:, :), allocatable mg_input_routines::lyth
```

3.2.2.34 maxfrq

```
real mg_input_routines::maxfrq
```

3.2.2.35 minfrq

```
real mg_input_routines::minfrq
```

3.2.2.36 mqvr

```
integer mg_input_routines::mqvr
```

3.2.2.37 mrx

```
integer mg_input_routines::mrx
```

3.2.2.38 msg

```
integer mg_input_routines::msg
```

3.2.2.39 mxerr

```
integer mg_input_routines::mxerr
```

3.2.2.40 mxfrqe

```
real mg_input_routines::mxfrqe
```

3.2.2.41 mxvrtx

```
integer mg_input_routines::mxvrtx
```

3.2.2.42 n_vrtx

```
integer, dimension(:), allocatable mg_input_routines::n_vrtx
```

3.2.2.43 ncell_ew

integer, dimension (:), allocatable mg_input_routines::ncell_ew

3.2.2.44 ncell_ns

integer, dimension (:), allocatable mg_input_routines::ncell_ns

3.2.2.45 ncell_z

integer, dimension (:), allocatable mg_input_routines::ncell_z

3.2.2.46 nchnl

integer mg_input_routines::nchnl

3.2.2.47 ncmp

integer, dimension(:, :), allocatable mg_input_routines::ncmp

3.2.2.48 ncmpg

integer, dimension (:), allocatable mg_input_routines::ncmpg

3.2.2.49 ncntd

real(kind=8) mg_input_routines::ncntd

3.2.2.50 nd

integer mg_input_routines::nd

3.2.2.51 ndr

```
integer mg_input_routines::ndr
```

3.2.2.52 nevents

```
integer mg_input_routines::nevents
```

3.2.2.53 new

```
logical mg_input_routines::new
```

3.2.2.54 nfrq

```
integer mg_input_routines::nfrq
```

3.2.2.55 nlq

```
integer mg_input_routines::nlq
```

3.2.2.56 nlith

```
integer mg_input_routines::nlith
```

3.2.2.57 nlyr

```
integer mg_input_routines::nlyr
```

3.2.2.58 nprism

```
integer mg_input_routines::nprism
```

3.2.2.59 nprop

integer, parameter mg_input_routines::nprop =7

3.2.2.60 npuls

integer mg_input_routines::npuls

3.2.2.61 nr

integer mg_input_routines::nr

3.2.2.62 nrgtx

integer, dimension(:), allocatable mg_input_routines::nrgtx

3.2.2.63 nrx

integer, dimension(:), allocatable mg_input_routines::nrx

3.2.2.64 nrxg

integer mg_input_routines::nrxg

3.2.2.65 nrxtx

integer, dimension(:), allocatable mg_input_routines::nrxtx

3.2.2.66 nsx

integer mg_input_routines::nsx

3.2.2.67 ntx

```
integer mg_input_routines::ntx
```

3.2.2.68 ntxe

```
integer mg_input_routines::ntxe
```

3.2.2.69 ntypls

```
integer mg_input_routines::ntypls
```

3.2.2.70 ntyrp

```
integer mg_input_routines::ntyrp
```

3.2.2.71 nw

```
integer mg_input_routines::nw
```

3.2.2.72 offtym

```
real mg_input_routines::offtym
```

3.2.2.73 output

```
integer mg_input_routines::output
```

3.2.2.74 pi

```
real, parameter mg_input_routines::pi =3.141592654
```

3.2.2.75 prfl

```
integer mg_input_routines::prfl
```

3.2.2.76 prism_east

```
real, dimension (:), allocatable mg_input_routines::prism_east
```

3.2.2.77 prism_eastd

```
real(kind=8), dimension (:), allocatable mg_input_routines::prism_eastd
```

3.2.2.78 prism_north

```
real, dimension (:), allocatable mg_input_routines::prism_north
```

3.2.2.79 prism_northd

```
real(kind=8), dimension (:), allocatable mg_input_routines::prism_northd
```

3.2.2.80 prism_zmid

```
real, dimension (:), allocatable mg_input_routines::prism_zmid
```

3.2.2.81 prism_zmidd

```
real(kind=8), dimension (:), allocatable mg_input_routines::prism_zmidd
```

3.2.2.82 prsm_cfr

```
real, dimension (:), allocatable mg_input_routines::prsm_cfr
```

3.2.2.83 prsm_chrg

real, dimension (:), allocatable mg_input_routines::prsm_chrg

3.2.2.84 prsm_res

real, dimension (:), allocatable mg_input_routines::prsm_res

3.2.2.85 prsm_size_ew

real, dimension (:), allocatable mg_input_routines::prsm_size_ew

3.2.2.86 prsm_size_ns

real, dimension (:), allocatable mg_input_routines::prsm_size_ns

3.2.2.87 prsm_size_z

real, dimension (:), allocatable mg_input_routines::prsm_size_z

3.2.2.88 prsm_tau

real, dimension (:), allocatable mg_input_routines::prsm_tau

3.2.2.89 prtcmp

integer, dimension (:,:), allocatable mg_input_routines::prtcmp

3.2.2.90 prtsec

logical mg_input_routines::prtsec

3.2.2.91 pulse

```
real mg_input_routines::pulse
```

3.2.2.92 qd

```
real(kind=8) mg_input_routines::qd
```

3.2.2.93 reftym

```
real mg_input_routines::reftym
```

3.2.2.94 reps

```
real, dimension(:), allocatable mg_input_routines::reps
```

3.2.2.95 reppsp

```
real, dimension (:), allocatable mg_input_routines::reppsp
```

3.2.2.96 res

```
real, dimension(:), allocatable mg_input_routines::res
```

3.2.2.97 rgtxid

```
integer, dimension(:, :), allocatable mg_input_routines::rgtxid
```

3.2.2.98 rmu

```
real, dimension(:), allocatable mg_input_routines::rmu
```

3.2.2.99 rmup

real, dimension (:), allocatable mg_input_routines::rmup

3.2.2.100 rx_type

integer, dimension (:), allocatable mg_input_routines::rx_type

3.2.2.101 rxaz

real, dimension (:,:), allocatable mg_input_routines::rxaz

3.2.2.102 rxdip

real, dimension (:,:), allocatable mg_input_routines::rxdip

3.2.2.103 rxe

real, dimension (:,:,), allocatable mg_input_routines::rxe

3.2.2.104 rxed

real(kind=8), dimension (:,:,), allocatable mg_input_routines::rxed

3.2.2.105 rxfmmt

real mg_input_routines::rxfmmt

3.2.2.106 rxid

integer, dimension (:,:), allocatable mg_input_routines::rxid

3.2.2.107 rxmnt

```
real, dimension(:, :), allocatable mg_input_routines::rxmnt
```

3.2.2.108 rxn

```
real, dimension(:, :, :), allocatable mg_input_routines::rxn
```

3.2.2.109 rxnd

```
real(kind=8), dimension(:, :, :), allocatable mg_input_routines::rxnd
```

3.2.2.110 rxoe

```
real mg_input_routines::rxoe
```

3.2.2.111 rxon

```
real mg_input_routines::rxon
```

3.2.2.112 rxoz

```
real mg_input_routines::rxoz
```

3.2.2.113 rxz

```
real, dimension(:, :, :), allocatable mg_input_routines::rxz
```

3.2.2.114 rxzd

```
real(kind=8), dimension(:, :, :), allocatable mg_input_routines::rxzd
```

3.2.2.115 solver

```
integer mg_input_routines::solver
```

3.2.2.116 source_type

```
integer mg_input_routines::source_type
```

3.2.2.117 step

```
integer mg_input_routines::step
```

3.2.2.118 survey_type

```
integer mg_input_routines::survey_type
```

3.2.2.119 swx

```
real, dimension(:), allocatable mg_input_routines::swx
```

3.2.2.120 swy

```
real, dimension(:, :), allocatable mg_input_routines::swy
```

3.2.2.121 sxaz

```
real, dimension(:), allocatable mg_input_routines::sxaz
```

3.2.2.122 sxdip

```
real, dimension(:), allocatable mg_input_routines::sxdip
```

3.2.2.123 sxe

```
real, dimension(:, :), allocatable mg_input_routines::sxe
```

3.2.2.124 sxd

```
real(kind=8), dimension(:, :), allocatable mg_input_routines::sxd
```

3.2.2.125 sxmnt

```
real, dimension(:), allocatable mg_input_routines::sxmnt
```

3.2.2.126 sxn

```
real, dimension(:, :), allocatable mg_input_routines::sxn
```

3.2.2.127 sxnd

```
real(kind=8), dimension(:, :), allocatable mg_input_routines::sxnd
```

3.2.2.128 sxz

```
real, dimension(:, :), allocatable mg_input_routines::sxz
```

3.2.2.129 sxzd

```
real(kind=8), dimension(:, :), allocatable mg_input_routines::sxzd
```

3.2.2.130 t0sx

```
real mg_input_routines::t0sx
```

3.2.2.131 tcls

```
real, dimension(:), allocatable mg_input_routines::tcls
```

3.2.2.132 tdfd

```
integer mg_input_routines::tdfd
```

3.2.2.133 te

```
real mg_input_routines::te
```

3.2.2.134 thk

```
real, dimension(:), allocatable mg_input_routines::thk
```

3.2.2.135 title

```
character (len=120) mg_input_routines::title
```

3.2.2.136 tms

```
real, dimension(:), allocatable mg_input_routines::tms
```

3.2.2.137 tn

```
real mg_input_routines::tn
```

3.2.2.138 topn

```
real, dimension(:), allocatable mg_input_routines::topn
```

3.2.2.139 trp

real, dimension(:), allocatable mg_input_routines::trp

3.2.2.140 tvals

integer, dimension(8) mg_input_routines::tvals

3.2.2.141 txid

integer, dimension(:), allocatable mg_input_routines::txid

3.2.2.142 txon

real, dimension(:), allocatable mg_input_routines::txon

3.2.2.143 units

integer, dimension(:), allocatable mg_input_routines::units

3.2.2.144 waveform

real, dimension(:), allocatable mg_input_routines::waveform

3.2.2.145 wtms

real, dimension(:), allocatable mg_input_routines::wtms

3.3 mg_metadata Module Reference

Variables

- character(len=40), parameter pname = 'Marco'
- character(len=40), parameter pvers = '5.0.0'
- character(len=40), parameter pdate = '30 January, 2020'
- character(len=40), parameter paut1 = 'CSIRO Electromagnetic Modelling Group'
- character(len=40), parameter paut2 = 'Zonghou Xiong, Art Raiche, David Annetts'
- character(len=40), parameter pproj = 'Internal'

3.3.1 Variable Documentation

3.3.1.1 paut1

```
character (len = 40), parameter mg_metadata::paut1 = 'CSIRO Electromagnetic Modelling Group'
```

3.3.1.2 paut2

```
character (len = 40), parameter mg_metadata::paut2 = 'Zonghou Xiong, Art Raiche, David Annetts'
```

3.3.1.3 pdate

```
character (len = 40), parameter mg_metadata::pdate = '30 January, 2020'
```

3.3.1.4 pname

```
character (len = 40), parameter mg_metadata::pname = 'Marco'
```

3.3.1.5 pproj

```
character (len = 40), parameter mg_metadata::pproj = 'Internal'
```

3.3.1.6 pvers

```
character (len = 40), parameter mg_metadata::pvers = '5.0.0'
```


Chapter 4

File Documentation

4.1 Marco.f90 File Reference

Modules

- module [mg_metadata](#)
- module [mg_filter_coefficients](#)
- module [mg_input_routines](#)

Functions/Subroutines

- subroutine [mg_input_routines::read_system_data](#)
- subroutine [mg_input_routines::read_model_data](#)
- subroutine [mg_input_routines::lyth_chk](#)
- subroutine [mg_input_routines::show_model](#)
- subroutine [mg_input_routines::set_freq](#)
- subroutine [mg_input_routines::set_survey](#)
- subroutine [mg_input_routines::set_trp](#)
- program [main](#)
- subroutine [bh_rotate](#) (NCHNL, LRX, NTXE, NRXTX, BHR, DXAZ, DXDIP, BTD)
- subroutine [bhc_rotate](#) (NFRQ, LRX, NTXE, NRXTX, BHR, DXAZ, DXDIP, BFD)
- subroutine [chk_symmetry](#) (NPRISM, NP11, LBLK, PBLK, TE, TN, KSYMM)
- subroutine [chk_sym_prop](#) (L1, L2, N1, E1, MATCH)
- real function [costrn](#) (WF, YFRQ, NFRQ, KFRQ, T)
- real function [cubint](#) (XKNOT, COEF, KNOT, X1, X2)
- subroutine [cubspl](#) (XNOT, C, N, IBCBEG, IBCEND)
- real function [cubval](#) (XKNOT, COEF, KNOT, X1)
- subroutine [fd_curnt](#) (NFRQ, LRX, NTXE, CURNT, RFD)
- subroutine [fdread](#) (ND, NFRQ, NTXE, LRX, NRXTX, NCMP, BFD, BFD_SCAT, OUTPUT)
- subroutine [interv](#) (XT, LXT, X, LEFT, MFLAG)
- subroutine [md_prm](#) (NW, SXDP1, SXAZ1, RXON, RXOE, RXOZ, CMPDX, DXPRM)
- subroutine [set_output_factors](#) (NRXG, MRX, SURVEY_TYPE, RX_TYPE, RXMNT, STEP, UNITS, OUTTXT, OUTFAC, AMR_UNITS)
- subroutine [set_source](#) (NSX, SWX, SWY, TOSX)
- subroutine [tdem_3d](#) (STEP, NSX, SWX, SWY, NPULS, PULSE, NTYPLS, NTYRP, TRP, NCHNL, TOPN, T↔CLS, FREQ, NFRQ, KFRQ, NTXE, LRX, NRXTX, RXID, NCMP, BFD1, BTD1)

- subroutine [fold_and_convolve](#) (STEP, NSX, SWX, SWY, NPULS, PULSE, TRP, NTYRP, NTYPLS, NCHNL, TOPN, TCLS, YPLS, YCUM)
- subroutine [lp_vertex_order](#) (NTXE, MXVRTX, N_VRTX, SXN, SXE, SXZ)
- real function [txcnvd](#) (MXCNV, T, NTYPLS, TRP, YPLS, NSX, SWX, SWY, K1)
- real function [txcnvl](#) (T, NTYPLS, TRP, YPLS, NSX, SWX, SWY)
- real function [linval](#) (NX, XVAL, YVAL, K1, X1)
- subroutine [txcmrg](#) (MXCNV, X1, Y1, N1, X2, Y2, N2, XCNV, YCNV, NCVN)
- subroutine [write_td](#) (NW, PRFL, STEP, NCHNL, TMS, SURVEY_TYPE, SOURCE_TYPE, NTXE, SXMNT, NRXG, NRGTX, RGTXID, NRX, LRX, MRX, UNITS, RX_TYPE, NCMPG, PRTCMP, RXMNT, RXED, RXND, RXZD, MQVR, CLCD, PRTSEC, TITLE, BT, BT_SCAT)
- subroutine [wrtdp](#) (NW, PRFL, PRTYP, NCHNL, TMS, NLOC, NRX1, JC, RXPLT, YTR)
- subroutine [wrtdt](#) (NW, PRTYP, NCHNL, TMS, NLOC, NRX1, JC, RXPLT, YTR)
- subroutine [write_fd_ppm](#) (NW, NFRQ, FREQ, NTXE, CMPDX, RXED, RXND, RXZD, TITLE, BFD, CURNT, DXPRM)
- subroutine [write_fd](#) (NW, PRFL, STEP, NFRQ, FREQ, SURVEY_TYPE, SOURCE_TYPE, NTXE, SXMNT, NRXG, NRGTX, RGTXID, LRX, MRX, NRX, UNITS, RX_TYPE, NCMPG, PRTCMP, RXMNT, RXED, RXND, RXZD, MQVR, PRTSEC, TITLE, BFD, BFD_SCAT)
- subroutine [wrfdp](#) (NW, PRFL, PRTYP, NFRQ, FREQ, NLOC, NRX1, JC, RXPLT, YTR)
- subroutine [wrfds](#) (NW, PRTYP, NFRQ, FREQ, NLOC, NRX1, JC, RXPLT, YTR)
- subroutine [wryt_log_file](#) (NLG, MSG, MXERR, ERR_LVL)
- subroutine [write_famx](#) (TITLE, STEP, OUTPUT, SOURCE_TYPE, SURVEY_TYPE, NFRQ, FREQ, NTXE, MXVRTX, N_VRTX, SXE, SXN, SXZ, SXDIP, SXAZ, SXMNT, NRGTX, NRXG, RGTXID, NCMPG, PRTCMP, LRX, MRX, NRX, MQVR, RX_TYPE, UNITS, RXED, RXND, RXZD, RXDIP, RXAZ, RXMNT, BFD, BFD_SCAT)
- subroutine [write_famx_ppm](#) (TITLE, STEP, OUTPUT, SOURCE_TYPE, SURVEY_TYPE, NFRQ, FREQ, NTXE, MXVRTX, SXE, SXN, SXZ, SXDIP, SXAZ, SXMNT, NRXG, NCMPG, PRTCMP, LRX, MRX, MQVR, RXED, RXND, RXZD, RXDIP, RXAZ, RXMNT, BFD, BFD_SCAT, DXPRM, CURNT, CMPDX)
- subroutine [fem_perc](#) (NFRQ, NSTNS, NUM, DEN, PRC)
- subroutine [wfamx_header](#) (NA, OUTPUT, NOUT)
- subroutine [write_tamx](#) (TITLE, STEP, OUTPUT, SOURCE_TYPE, SURVEY_TYPE, NCHNL, TMS, NTXE, MXVRTX, N_VRTX, SXE, SXN, SXZ, SXDIP, SXAZ, SXMNT, NRGTX, NRXG, RGTXID, NCMPG, PRTCMP, LRX, MRX, NRX, MQVR, RX_TYPE, UNITS, RXED, RXND, RXZD, RXDIP, RXAZ, RXMNT, CLCD, BT, BT_SCAT)
- subroutine [tem_perc](#) (NCHNL, NSTNS, NUM, DEN, PRC)
- subroutine [wamx_cldist](#) (NLOC, RXPLT, SLENG, STNS)
- subroutine [wamx_pos](#) (MODE, MRX, NRXG, MQVR, JX, JG, N_CORNR, RXED, RXND, RXZD, RXPLT, SLENG, STNS)
- subroutine [wtamx_header](#) (NA, OUTPUT, NOUT)
- subroutine [set_output_scaling](#) (NRXG, MRX, SURVEY_TYPE, RX_TYPE, RXMNT, STEP, UNITS, OUT_SCALE, OUT_UNITS)
- subroutine [marco_3d](#) (NW, DO3D, NFRQ, FREQ, SURVEY_TYPE, SOURCE_TYPE, NTXE, MXVRTX, N_VRTX, SXE, SXN, SXZ, SXDIP, SXAZ, NRXG, NRGTX, RX_TYPE, RGTXID, NRXTX, NRX, MRX, LRX, MQVR, RXE, RXN, RXZ, NLYR, THK, RES, RMU, REPS, CHRG, CTAU, CFREQ, KSYMM, NPRISM, PRISM_ZMID, PRISM_EAST, PRISM_NORTH, PRISM_SIZE_EW, PRISM_SIZE_NS, PRISM_SIZE_Z, NCELL_EW, NCELL_NS, NCELL_Z, PRISM_RES, RMUP, REPS, PRISM_CHRG, PRISM_TAU, PRISM_CFR, KACC, SOLVER, BFD, BFD_SCAT)
- subroutine [tx_rx_converter](#) (SURVEY_TYPE, SOURCE_TYPE, NTXE, MXVRTX, N_VRTX, SXE, SXN, S_XZ, SXDIP, SXAZ, NRXG, NRGTX, RX_TYPE, RGTXID, NRXTX, NRX, MRX, LRX, MQVR, RXE, RXN, RXZ, SUB_RX_MAX, SUB_BIPOLE, TX_CRDX, TX_CRDY, TX_CRDZ, MD_ANGLE, N_RX, RX_X, RX_Y, RX_Z, RX_TYPE_INDEX, N_SUB_RX, RX_WEIGHT, LOOP_INTEG_ACCURACY)
- subroutine [rx_loop_integ](#) (NVRTX, VERTEX, ACCURACY, NINTEG_MAX, NINTEG, INTEG_POINTS, INTEG_WEIGHTS)
- subroutine [compute_3d](#) (NFRQ, FREQ, SOURCE_TYPE, NW, NTXE, NCRD, N_VRTX, TX_CRDX, TX_CRDY, TX_CRDZ, MD_ANGLE, RX_TYPE_INDEX, N_SUB_RX, RX_WEIGHT, M_RX, N_RX, RX_X, RX_Y, RX_Z, SUB_RX_MAX, MLAYER, LRYTH, RES_LYR, RMU_LYR, RESP_LYR, CHRG_LYR, TAU_LYR, F_RQC_LYR, DO3D, SOLVER, KACC, KSYMM, TRGT_BLACK, BLACK_NX, BLACK_NY, BLACK_NZ, BLACK_LX, BLACK_LY, BLACK_LZ, BLACK_CX, BLACK_CY, BLACK_CZ, RSB, CHRSB, TAUSB, CFRSB, RMUP, REPS, E_ONLY, EPX, EPY, EPZ, HPX, HPY, HPZ, VOLTP, E3X, E3Y, E3Z, H3X, H3Y, H3Z, VOLT3)

- subroutine [structuring](#)
- subroutine [init_rhomas](#) (DO3D, MBODY, NBMAX, NXMAX, NYMAX, KSYMM, NBODY, SUB_BLOCK, NX, NY, XCELL, YCELL, BLX, BLY, NTXE, NCRD, TX_CRDX, TX_CRDY, N_RX, RX_X, RX_Y, SUB_RX_MAX, N_SUB_RX, M_RX, RHOMIN, RMAX1, RMIN1, RMAX2, RMIN2)
- subroutine [test_wire_path](#) (SOURCE_TYPE, DMIN, NCRD, NTXE, TX_CRDX, TX_CRDY, TX_CRDZ, WI←RE_PATH, CS_TYPE)
- subroutine [init_cmplx_cd_1d](#) (NW, FRQ, COLE_COLE, MLAYER, KANIS, HVK, RES_LYR, CHRG_LYR, T←AU_LYR, FRQC_LYR, RMU_LYR, RESP_LYR, DCHRG_LYR, DTAU_LYR, DFRQC_LYR, CDH, CDV, KKH)
- subroutine [init_cmplx_cd_3d](#) (FRQ, COLE_COLE, NBMAX, NBODY, SUB_BLOCK, NCELL, BLZ, ZBND, N←LAYER, RMU, NSUBCM, CDB, RBC, CHRBC, TAUBC, CFRBC, DEBC, RMUB)
- subroutine [init_computation](#) (DMIN, MBODY, NBMAX, NXMAX, NYMAX, NZMAX, CS_TYPE, KSYMM, NT←XE, SUB_RX_MAX, M_RX, N_RX, N_SUB_RX, RX_X, RX_Y, RX_Z, ZMT, MT_PROFL, MT_STATN, XRMT, YRMT, NBODY, SUB_BLOCK, NX, NY, NZ, BLX, BLY, BLZ, XBL, YBL, ZBL, X1, Y1, Z1, NCT, NET, NCELL, NCTT, NEQ, XCELL, YCELL, ZCELL, KCELL, KBOUND, MLAYER, ZBND, KSFT, KEYSF, KGHP, BLMIN)
- subroutine [init_3d_input_test](#) (NW, KAUTO, KSYMM, DMIN, NSUBCM, MBODY, NBMAX, NXMAX, NYM←AX, NZMAX, NBODY, TRGT_BLK, BLCK_LX, BLCK_LY, BLCK_LZ, BLCK_CX, BLCK_CY, BLCK_CZ, NCT, SUB_BLOCK, NX, NY, NZ, BLX, BLY, BLZ, XBL, YBL, ZBL, MLAYER, ZBND, ZCELL)
- subroutine [init_discretization](#) (BLX, BLY, BLZ, NX, NY, NZ, XCD, YCD, ZCD, X, Y, Z)
- subroutine [init_ref_cell_dim](#) (NW, MBODY, NBMAX, NBODY, SUB_BLOCK, BLX, BLY, BLZ, DMIN, KCLMN, CLMN)
- subroutine [init_super_block](#) (NW, MBODY, NBMAX, NSMR, KSYMM, DMIN, NXMAX, NYMAX, NZMAX, N←BODY, SUB_BLOCK, BLX, BLY, BLZ, NX, NY, NZ, XBL, YBL, ZBL, XCELL, YCELL, ZCELL, SBX, SBY, SBZ, XSB, YSB, ZSB, SCX, SCY, SCZ, NXS, NYS, NZS, KSMR)
- subroutine [z_zp_lvls](#) (NW, MZGRID, CS_TYPE, NTXE, N_SUB_RX, M_RX, SUB_RX_MAX, N_RX, NCRD, TX_CRDZ, RX_Z, WIRE_PATH, DMIN, NZSRMAX, NZSR, ZSRG, NZOB, ZOBG)
- subroutine [init_zlvls](#) (NW, MBODY, NBMAX, NZMAX, KSMR, NBODY, SUB_BLOCK, NZS, NZ, SBZ, SCZ, ZSB, ZCELL, BLZ, MZGRID, DMIN, NZSR, ZSRG, NZOB, ZOBG)
- subroutine [main_prm_at_cell](#) (NW, FRQ, MLAYER, ZBND, LRYTH, HVK, KKH, CDH, KANIS, HIGH_FRQ, CS_TYPE, KSYMM, MBODY, NBMAX, NSUBCM, NMAX, NXMAX, NYMAX, NZMAX, NTXE, MD_ANGLE, NCRD, N_VRTX, TX_CRDX, TX_CRDY, TX_CRDZ, RAD, NPOL, LP1, LP2, NBODY, SUB_BLOCK, NET, NEQ, NX, NY, NZ, NCELL, XCELL, YCELL, ZCELL, NXI, NYI, NZI, NCELLI, XCELLI, YCELLI, ZCELLI, CDB, EN, EMT, ENT, EJGS, EJGS2, RHOMIN, RHOMAX, NZOB, ZOBG, NZSR, ZSRG, NZBG, ZBG, KACC, AJ, DMIN, NHFILM, ALMAX, BLMIN, GRHF, RRG, GRHO0)
- subroutine [main_super_grid](#) (GSB1, HIGH_FRQ, CLMN2, KANIS, SBX, SBY, SBZ, NXS, NYS, NZS, XSB, YSB, ZSB, NSMR, FRQ, MLAYER, ZBND, LRYTH, KKH, CDH, HVK, NZOB, ZOBG, NZSR, ZSRG, DMIN, NHFILM, RHOMIN, RHOMAX, RRG, RRG3, GRHF, GRHF3, GRHO0, GRHO03, ALMAX, KSFT, KCLMN, BLMIN, KACC, KUTCPR)
- subroutine [main_matrices](#) (NW, HIGH_FRQ, NPOL, KSMR, CLMN, KANIS, KBOUND, KSYMM, CS_TYPE, KCOND, GA, GSB2, IND, VV, GAI, EN, EMT, CDB, MBODY, NBMAX, NXMAX, NYMAX, NZMAX, NSUBCM, NBODY, SUB_BLOCK, NET, NX, NY, NZ, NCELL, BLX, BLY, BLZ, XCELL, YCELL, ZCELL, KCELL, NEQ, NMAX, NXI, NYI, NZI, NCELLI, BLXI, BLYI, BLZI, XCELLI, YCELLI, ZCELLI, NXJ, NYJ, NZJ, NCELLJ, X←CELLJ, YCELLJ, ZCELLJ, SBX, SBY, SBZ, NXS, NYS, NZS, ZSB, NSMR, FRQ, MLAYER, ZBND, LRYTH, KKH, CDH, CDV, HVK, NZOB, ZOBG, NZSR, ZSRG, DMIN, NHFILM, RHOMIN, RHOMAX, RRG, RRG3, GRHF, GRHF3, GRHO0, GRHO03, ALMAX, KSFT, KCLMN, BLMIN, KACC, KUTCPR)
- subroutine [main_solver](#) (NW, GA, IND, EMT, EN, ENT, NET, JST, EJGS, EJGS2, KACC, KSMR, KSYMM, CS_TYPE, KANIS, KBOUND, NTXE, LP1, LP2, NPOL, MBODY, NBMAX, NXMAX, NYMAX, NZMAX, NMAX, NBODY, SUB_BLOCK, NX, NY, NZ, NCELL, NCT, KCELL, XCELL, YCELL, ZCELL, BLX, BLY, BLZ, NXI, NYI, NZI, NCELLI, XCELLI, YCELLI, ZCELLI, BLXI, BLYI, BLZI, NXJ, NYJ, NZJ, NCELLJ, XCELLJ, YCELLJ, ZCELLJ, SBX, SBY, SBZ, NXS, NYS, NZS, ZSB, NSMR, GSB2, NEQ)
- subroutine [main_prm_at_rcv](#) (HIGH_FRQ, CS_TYPE, KACC, MLAYER, ZBND, RMU_LYR, CDH, FRQ, N←TXE, MD_ANGLE, NCRD, M_RX, N_SUB_RX, RX_TYPE_INDEX, SUB_RX_MAX, SOURCE_TYPE, N_RX, RX_X, RX_Y, RX_Z, RX_WEIGHT, N_VRTX, TX_CRDX, TX_CRDY, TX_CRDZ, E_ONLY, ENX, ENY, ENZ, HNX, HNY, HNZ, VLT1D, NHFILM, LRYTH, HVK, KKH, KANIS, BLMIN, DMIN, RHOMIN, RHOMAX, NZOB, ZOBG, NZSR, ZSRG, NZBG, ZBG, ALMAX, GRHF, RRG, GRHO0)
- subroutine [main_scatt_eh_cs](#) (SUB_RX_MAX, RX_TYPE_INDEX, HIGH_FRQ, KACC, KSYMM, MBODY, N←BMAX, NSUBCM, NBODY, SUB_BLOCK, NCELL, NET, TCDB, EMT, JST, EJGS, NMAX, NTXE, N_RX, N←_SUB_RX, RX_WEIGHT, NHFILM, FRQ, MLAYER, ZBND, LRYTH, HVK, KKH, RMU_LYR, KANIS, BLMIN,

DMIN, RHOMIN, RHOMAX, NZOB, ZOBG, NZSR, ZSRG, ALMAX, RRG, RRG3, GRHF, GRHF3, GRHO0, GRHO03, RX_X, RX_Y, RX_Z, NXMAX, NYMAX, NZMAX, NEQ, NX, NY, NZ, XCELL, YCELL, ZCELL, BLX, BLY, BLZ, CDH, CDV, KSFT, CLMN, M_RX, ENX, ENY, ENZ, EAX, EAY, EAZ, HAX, HAY, HAZ, VLT3D, ESX, ESX, ESZ, HSX, HSY, HSZ)

- subroutine [main_scat_eh_mt](#) (HIGH_FRQ, KACC, KSYMM, MBODY, NBMAX, NSUBCM, NBODY, SUB_BLOCK, NCELL, TCDB, JST, NMAX, NHFILM, FRQ, MLAYER, ZBND, LRYTH, HVK, KKH, KANIS, BLMIN, DMIN, RHOMIN, RHOMAX, NZOB, ZOBG, NZSR, ZSRG, ALMAX, RRG, RRG3, GRHF, GRHF3, GRHO0, GRHO03, MT_PROFL, MT_STATN, XRMT, YRMT, NXMAX, NYMAX, NZMAX, NX, NY, NZ, XCELL, YCELL, ZCELL, BLX, BLY, BLZ, CDH, NPOL, E0X1, E0Y1, ZMT, KSFT, CLMN, EXMT, EYMT, HXMT, HYMT, HZMT)
- subroutine [mtrx_1m](#) (NMAX, N, NXMAX, NYMAX, NZMAX, NX, NY, NZ, NCELL, NSUBCM, SUB_BLOCK, X, Y, Z, CLX, CLY, CLZ, CDB, G, FRQ, MLAYER, ZBND, CDH, CDV, HVK, NZOB, ZOBG, NZSR, ZSRG, RHOMIN, DMIN, NHFILM, RRG, NRG, GRHF, RRG3, NRG3, GRHF3, GRHO0, GRHO03, CLMN, KCLMN, BLMIN, KACC, KUTCPR)
- subroutine [mtrx_1ms](#) (NMAX, N, NXMAX, NYMAX, NZMAX, NX, NY, NZ, NCELL, NSUBCM, SUB_BLOCK, X, Y, Z, CLX, CLY, CLZ, CDB, G, FRQ, MLAYER, ZBND, CDH, CDV, HVK, NZOB, ZOBG, NZSR, ZSRG, RHOMIN, DMIN, NHFILM, RRG, NRG, GRHF, RRG3, NRG3, GRHF3, GRHO0, GRHO03, CLMN, KCLMN, BLMIN, KACC, KUTCPR)
- subroutine [mtrx_3m](#) (NMAX, N, NXMAX, NYMAX, NZMAX, NX, NY, NZ, NCELL, NSUBCM, SUB_BLOCK, X, Y, Z, CLX, CLY, CLZ, CDB, KSYM, G, FRQ, MLAYER, ZBND, CDH, CDV, HVK, NZOB, ZOBG, NZSR, ZSRG, RHOMIN, DMIN, NHFILM, RRG, NRG, GRHF, RRG3, NRG3, GRHF3, GRHO0, GRHO03, CLMN, KCLMN, BLMIN, KACC, KUTCPR)
- subroutine [mtrx_3ms](#) (NMAX, N, NXMAX, NYMAX, NZMAX, NX, NY, NZ, NCELL, NSUBCM, SUB_BLOCK, X, Y, Z, CLX, CLY, CLZ, CDB, KSYM, G, FRQ, MLAYER, ZBND, CDH, CDV, HVK, NZOB, ZOBG, NZSR, ZSRG, RHOMIN, DMIN, NHFILM, RRG, NRG, GRHF, RRG3, NRG3, GRHF3, GRHO0, GRHO03, CLMN, KCLMN, BLMIN, KACC, KUTCPR)
- subroutine [mtrx_m](#) (NMAX, N, NXMAX, NYMAX, NZMAX, NX1, NY1, NZ1, NCELL1, SUB_BLOCK1, X1, Y1, Z1, NX2, NY2, NZ2, NCELL2, SUB_BLOCK2, X2, Y2, Z2, CLX2, CLY2, CLZ2, G, FRQ, MLAYER, ZBND, CDH, HVK, NZOB, ZOBG, NZSR, ZSRG, RHOMIN, DMIN, NHFILM, RRG, NRG, GRHF, RRG3, NRG3, GRHF3, GRHO0, GRHO03, CLMN, KCLMN, BLMIN, KACC, KUTCPR)
- subroutine [mtrx_ms](#) (NMAX, N, NXMAX, NYMAX, NZMAX, NX1, NY1, NZ1, NCELL1, SUB_BLOCK1, X1, Y1, Z1, NX2, NY2, NZ2, NCELL2, SUB_BLOCK2, X2, Y2, Z2, CLX2, CLY2, CLZ2, KSYM, G, FRQ, MLAYER, ZBND, CDH, HVK, NZOB, ZOBG, NZSR, ZSRG, RHOMIN, DMIN, NHFILM, RRG, NRG, GRHF, RRG3, NRG3, GRHF3, GRHO0, GRHO03, CLMN, KCLMN, BLMIN, KACC, KUTCPR)
- subroutine [mtrx_spsgsb](#) (SBX, SBY, SBZ, NXS, NYS, NZS, ZSB, YSB, ZSB, NSMR, G, FRQ, MLAYER, ZBND, CDH, HVK, NZOB, ZOBG, NZSR, ZSRG, RHOMIN, DMIN, NHFILM, RRG, NRG, GRHF, RRG3, NRG3, GRHF3, GRHO0, GRHO03, CLMN, KCLMN, BLMIN, KACC, KUTCPR)
- subroutine [mtrx_sps](#) (NSMR, MLAYER, ZBND, CDH, CDV, SBX, SBY, SBZ, NXS, NYS, NZS, ZSB, NMAX, N, NXMAX, NYMAX, NZMAX, NX, NY, NZ, NCELL, NSUBCM, SUB_BLOCK, X, Y, Z, CDB, GSB2, G)
- subroutine [mtrx_sps](#) (NSMR, MLAYER, ZBND, CDH, CDV, SBX, SBY, SBZ, NXS, NYS, NZS, ZSB, NMAX, N, NXMAX, NYMAX, NZMAX, NX, NY, NZ, NCELL, NSUBCM, SUB_BLOCK, X, Y, Z, CDB, KSYM, G, GSB2)
- subroutine [mtrx_spsm](#) (SBX, SBY, SBZ, NXS, NYS, NZS, ZSB, NMAX, N, NXMAX, NYMAX, NZMAX, NX1, NY1, NZ1, NCELL1, SUB_BLOCK1, X1, Y1, Z1, NX2, NY2, NZ2, NCELL2, SUB_BLOCK2, X2, Y2, Z2, G, NSMR, GSB2)
- subroutine [mtrx_spsm](#) (SBX, SBY, SBZ, NXS, NYS, NZS, ZSB, NMAX, N, NXMAX, NYMAX, NZMAX, NX1, NY1, NZ1, NCELL1, SUB_BLOCK1, X1, Y1, Z1, NX2, NY2, NZ2, NCELL2, SUB_BLOCK2, X2, Y2, Z2, KSYM, G, NSMR, GSB2)
- subroutine [mtrx_spsm2](#) (SBX, SBY, SBZ, NXS, NYS, NZS, ZSB, NMAX, NJ, N, NXMAX, NYMAX, NZMAX, NX1, NY1, NZ1, NCELL1, SUB_BLOCK1, X1, Y1, Z1, NX2, NY2, NZ2, NCELL2, SUB_BLOCK2, X2, Y2, Z2, KPOL, G, NSMR, GSB2)
- subroutine [mtrx_sps1b](#) (NMAX, N, NXMAX, NYMAX, NZMAX, NX, NY, NZ, NSUBCM, SUB_BLOCK, X, Y, Z, CLX, CLY, CLZ, CDB, G, FRQ, MLAYER, ZBND, CDH, CDV, HVK, NZOB, ZOBG, NZSR, ZSRG, RHOMIN, DMIN, NHFILM, RRG, NRG, GRHF, RRG3, NRG3, GRHF3, GRHO0, GRHO03, CLMN, KCLMN, BLMIN, KACC, KUTCPR)
- subroutine [mtrx_gs](#) (KSMR, NSMR, NXS, NYS, NZS, ZSB, YSB, ZSB, KS, KDIAG, N, N2, CLX, CLY, CLZ, XSR, YSR, ZSR, NMAX, NXMAX, NYMAX, NZMAX, NX, NY, NZ, NCELL, NSUBCM, SUB_BLOCK, X, Y, Z, CDB, G, GSB2, FRQ, MLAYER, ZBND, CDH, CDV, HVK, NZOB, ZOBG, NZSR, ZSRG, RHOMIN, DMIN, NHFILM, RRG, NRG, GRHF, RRG3, NRG3, GRHF3, GRHO0, GRHO03, CLMN, KCLMN, BLMIN, KACC, KUTCPR)

- subroutine [mtrx_smrgs](#) (NXS, NYS, NZS, SBX, SBY, SBZ, ZSB, NMAX, NXMAX, NYMAX, NZMAX, NETI, SUB_BLOCKI, NCELLI, XCELLI, YCELLI, ZCELLI, NXI, NYI, NZI, NET, SUB_BLOCK, NCELL, NX, NY, NZ, X, Y, Z, LQ, G, NSMR, GSB2)
- subroutine [mtrx_slv_factor](#) (NW, A, NMAX, N, IND, V, C1, AI, KSYM, KCOND, ANORM1, ANORM3, COND1, COND3, AEM)
- subroutine [mtrx_slv_ludcmp](#) (NW, A, NP, N, INDEX, VV, D)
- subroutine [mtrx_slv_lubksb](#) (A, B, NP, N, INDEX)
- subroutine [mtrx_slv_csifa](#) (A, LDA, N, KPVT, INFO)
- subroutine [mtrx_slv_csisl](#) (A, LDA, N, KPVT, B)
- integer function [isamax](#) (N, SX, INCX)
- subroutine [mtrx_slv_saxpy](#) (N, SA, SX, INCX, SY, INCY)
- complex function [sdot](#) (N, SX, INCX, SY, INCY)
- subroutine [mtrx_slv_sswap](#) (N, SX, INCX, SY, INCY)
- subroutine [mtrx_unitary](#) (PR, QR, I, PC, QC, J, U)
- subroutine [en_prm](#) (FRQ, MLAYER, ZBND, LRYTH, KKH, CDH, NET, SUB_BLOCK, NSUBCM, NZMAX, NX, NY, NZ, NCELL, ZCELL, CDB, KPOL, EN, ECD)
- subroutine [en_prm_mt](#) (FRQ, MLAYER, ZBND, LRYTH, KKH, NOBSV, ZOB, EX, EY, HX, HY)
- subroutine [en_prm_cs](#) (NET, SUB_BLOCK, NSUBCM, NXMAX, NYMAX, NZMAX, NX, NY, NZ, NCELL, X←CELL, YCELL, ZCELL, CDB, CS_TYPE, NCRD, TX_CRDX, TX_CRDY, TX_CRDZ, RAD, EN, ECD, FRQ, MLAYER, ZBND, KKH, CDH, ANGLES, KEYG, KACC, AJ, NZOB, ZOBG, NZSR, ZSRG, RHOMIN, NHFILM, RRG, NRG, GRHF, GRHO0)
- subroutine [en_prm_gs](#) (NEQ, NBODY, SUB_BLOCK, NBMAX, NXMAX, NYMAX, NZMAX, NET, NX, NY, NZ, NCELL, XCELL, YCELL, ZCELL, CS_TYPE, NCRD, TX_CRDX, TX_CRDY, TX_CRDZ, RAD, EN, FRQ, M←LAYER, ZBND, KKH, CDH, ANGLES, KEYG, KACC, AJ, NZOB, ZOBG, NZSR, ZSRG, RHOMIN, NHFILM, RRG, NRG, GRHF, GRHO0)
- subroutine [one_d_kernel](#) (KEYG, KEMD, MLAYER, ZBND, LRYTH, HVK, KKH, KANIS, KPRM, KRHO, KITG, KCHRG, NOB, NSR, ZOB, ZSR, ZSRH, ZSRL, LUMBDA, FKNS)
- subroutine [one_d_0_2_infty](#) (KEYG, KEMD, MLAYER, ZBND, LRYTH, HVK, KKH, KANIS, KPRM, KITG, KCHRG, NOB, NSR, ZOB, ZSRH, ZSRL, ALMAX, KEH, S)
- subroutine [one_d_simpson_for_hankel](#) (KEYG, KEMD, MLAYER, ZBND, LRYTH, HVK, KKH, KANIS, KPRM, KRHO, KITG, KCHRG, NOB, NSR, ZOB, ZSRH, ZSRL, A, B, EPS, K, N, KEH, S, ST)
- subroutine [one_d_simpes](#) (A, B, EPS, N, FK, S, RDJXYZ, AJ, CS_TYPE, KEMD, KEYG, PSTION, FRQ, MLAYER, ZBND, KKH, CDH, NZOB, ZOBG, NZSR, ZSRG, RHOMIN, NHFILM, RRG, NRG, GRHF, GRHO0)
- subroutine [one_d_line](#) (X, AJXYZ, AJ, NF, F, CS_TYPE, KEMD, KEYG, PSTION, FRQ, MLAYER, ZBND, KKH, CDH, NZOB, ZOBG, NZSR, ZSRG, RHOMIN, NHFILM, RRG, NRG, GRHF, GRHO0)
- subroutine [one_d_circle](#) (THETA, RAD, AJ, NF, F, CS_TYPE, KEMD, KEYG, PSTION, FRQ, MLAYER, ZBND, KKH, CDH, NZOB, ZOBG, NZSR, ZSRG, RHOMIN, NHFILM, RRG, NRG, GRHF, GRHO0)
- subroutine [one_d_source](#) (CS_TYPE, ANGLES, RECVR, NCRD, TX_CRDX, TX_CRDY, TX_CRDZ, RAD, KEYG, KACC, FRQ, MLAYER, ZBND, AJ, KKH, CDH, NZOB, ZOBG, NZSR, ZSRG, RHOMIN, NHFILM, RRG, NRG, GRHF, GRHO0, EHFLD)
- subroutine [one_d_green](#) (CS_TYPE, KEMD, KEYG, PSTION, FRQ, MLAYER, ZBND, KKH, CDH, NZOB, ZOBG, NZSR, ZSRG, RHOMIN, NHFILM, RRG, NRG, GRHF, GRHO0, ECOMP, HCOMP)
- subroutine [interpo_2d_lg6](#) (GRHF, A, L, NHFILM, NZSR, NZOB, X, IOB, ZSR, ZSRG, F, NF)
- subroutine [interpo_lg6_rho0](#) (GRHO0, NZSR, NZOB, IOB, ZSR, ZSRG, F, NF)
- subroutine [one_d_hf_table](#) (HIGH_FRQ, NHFILM, MLAYER, ZBND, LRYTH, HVK, KKH, KANIS, BLMIN, CS_TYPE, KEYG, DMIN, RHOMIN, RHOMAX, NZOB, ZOBG, NZSR, ZSRG, NZBG, ZBG, ALMAX, GRHF, RRG, NRG, GRHO0)
- subroutine [interpo_lg](#) (GRHF, A, L, NHFILM, NZSR, NZOB, X, IOB, ISR, F, NF)
- subroutine [interpo_lg1](#) (GRHF3, A, L, NHFILM, NZSR, X, ISR, F, NF)
- subroutine [interpo_lg4](#) (GRHF, A, L, NHFILM, NZSR, NZOB, X, IOB, ISR, F, NF)
- subroutine [interpo_lg5](#) (GRHF3, A, L, NHFILM, NZSR, X, ISR, F, NF)
- subroutine [interpo_lg6](#) (GRHF, A, L, NHFILM, NZSR, NZOB, X, IOB, ISR, F, NF)
- subroutine [interpo_plpol](#) (GRHF, A, L, NHFILM, NZSR, NZOB, X, IOB, ISR, F, NF)
- subroutine [interpo_polint](#) (XA, YA, N, X, Y, DY)
- subroutine [thr_d_hf_table](#) (HIGH_FRQ, NHFILM, MLAYER, ZBND, LRYTH, HVK, KKH, KANIS, KSFT, BL←MIN, KEYG, DMIN, RHOMIN, RHOMAX, NZOB, ZOBG, NZSR, ZSRG, ALMAX, RRG, NRG, RRG3, NRG3, GRHF, GRHF3, GRHO0, GRHO03)

- subroutine [thr_d_green](#) (KEYG, PSTION, FRQ, MLAYER, ZBND, CDH, HVK, NZOB, ZOBG, NZSR, ZSRG, RHOMIN, DMIN, NHFILM, RRG, NRG, GRHF, RRG3, NRG3, GRHF3, GRHO0, GRHO03, CLX, CLY, CLZ, CLMN, KCLMN, BLMIN, KACC, KUTCPR, KSELF, ECOMP, HCOMP)
- subroutine [thr_d_vxyz](#) (CLX, CLY, CLZ, XSR, YSR, ZSR, XX, YY, ZZ)
- subroutine [thr_d_geprm](#) (PSTION, KACC, KSELF, CLREF, MXINT, MYINT, MZINT, CLX, CLY, CLZ, FRQ, CDH, HVK, DMIN, GAX, ECOMP)
- subroutine [thr_d_gaself](#) (CLX, CLY, CLZ, MXINT, MYINT, MZINT, CDH, HVK, K, DMIN, GX, GZ)
- subroutine [thr_d_g12](#) (CLX, CLY, CLZ, CDH, HVK, K, G1, G2)
- subroutine [thr_d_ghprm](#) (PSTION, KACC, BLMIN, CLREF, MXINT, MYINT, MZINT, CLX, CLY, CLZ, FRQ, CDH, HVK, DMIN, HCOMP)
- subroutine [scat_eh_mt](#) (NBMAX, NMAX, NXMAX, NYMAX, NZMAX, NBODY, SUB_BLOCK, MT_PROFL, MT_STATN, XRMT, YRMT, NX, NY, NZ, NCELL, X, Y, Z, CLX, CLY, CLZ, JS, NPOL, KSFT, NSUBCM, CDB, CLMN, ZMT, E0X1, E0Y1, EXMT, EYMT, HXMT, HYMT, HZMT, FRQ, MLAYER, ZBND, CDH, HVK, NZ↵OB, ZOBG, NZSR, ZSRG, RHOMIN, DMIN, NHFILM, RRG, NRG, GRHF, RRG3, NRG3, GRHF3, GRHO0, GRHO03, KCLMN, BLMIN, KACC)
- subroutine [scat_eh_mts](#) (NBMAX, NMAX, NXMAX, NYMAX, NZMAX, NBODY, SUB_BLOCK, MT_PROFL, MT_STATN, XRMT, YRMT, NX, NY, NZ, NCELL, X, Y, Z, CLX, CLY, CLZ, JS, NPOL, KSFT, NSUBCM, CDB, CLMN, ZMT, E0X1, E0Y1, EXMT, EYMT, HXMT, HYMT, HZMT, FRQ, MLAYER, ZBND, CDH, HVK, NZ↵OB, ZOBG, NZSR, ZSRG, RHOMIN, DMIN, NHFILM, RRG, NRG, GRHF, RRG3, NRG3, GRHF3, GRHO0, GRHO03, KCLMN, BLMIN, KACC)
- subroutine [scat_eh_csgs](#) (SUB_RX_MAX, RX_TYPE_INDEX, N_SUB_RX, RX_WEIGHT, NBMAX, NEQ, NXMAX, NYMAX, NZMAX, NBODY, SUB_BLOCK, NET, N_RX, RX_X, RX_Y, RX_Z, NX, NY, NZ, NCE↵LL, X, Y, Z, CLX, CLY, CLZ, JS, NSUBCM, CDB, IEXCI, CLMN, M_RX, NTXE, VLT, ENX, ENY, ENZ, EAX, EAY, EAZ, HAX, HAY, HAZ, FRQ, MLAYER, ZBND, CDH, CDV, HVK, RMU_LYR, NZOB, ZOBG, NZSR, Z↵SRG, RHOMIN, DMIN, NHFILM, RRG, NRG, GRHF, RRG3, NRG3, GRHF3, GRHO0, GRHO03, KCLMN, BLMIN, KACC)
- subroutine [scat_eh_cs](#) (SUB_RX_MAX, RX_TYPE_INDEX, N_SUB_RX, RX_WEIGHT, NBMAX, NMAX, N↵XMAX, NYMAX, NZMAX, NBODY, SUB_BLOCK, N_RX, RX_X, RX_Y, RX_Z, NX, NY, NZ, NCELL, X, Y, Z, CLX, CLY, CLZ, JS, NSUBCM, CDB, IEXCI, CLMN, M_RX, NTXE, VLT, ENX, ENY, ENZ, EAX, EAY, EAZ, H↵AX, HAY, HAZ, FRQ, MLAYER, ZBND, CDH, CDV, HVK, RMU_LYR, NZOB, ZOBG, NZSR, ZSRG, RHOMIN, DMIN, NHFILM, RRG, NRG, GRHF, RRG3, NRG3, GRHF3, GRHO0, GRHO03, KCLMN, BLMIN, KACC)
- subroutine [hfill](#) (KEYG, KEMD, MLAYER, ZBND, LRYTH, HVK, KKH, KANIS, KPRM, KITG, KCHRG, NOB, NSR, RLO, RHI, ZOB, ZSRH, ZSRL, NRG, RRG, HF, NHFILM)
- subroutine [hfilh](#) (KEYG, KEMD, MLAYER, ZBND, LRYTH, HVK, KKH, KANIS, KPRM, KITG, KCHRG, NOB, NSR, RLO, RHI, ZOB, ZSRH, ZSRL, NRG, RRG, HF, NHFILM)
- subroutine [print_fd](#) (NW, PRFL, M_RX, NFRQ, NTX_EVENT, N_RX, SOURCE_TYPE, SURVEY_TYPE, F↵REQ, SUB_RX_MAX, SUB_BIPOLE, RX_X, RX_Y, RX_Z, N_SIDE, NCRD, RXOE, RXON, RXOZ, RX_T↵YPE_INDEX, TX_CRDX, TX_CRDY, TX_CRDZ, MD_ANGLE, DO3D, HPX, HPY, HPZ, VOLTP, HSX, HSY, HSZ, VOLTS)

Variables

- character(len=40), parameter [mg_metadata::pname](#) = 'Marco'
- character(len=40), parameter [mg_metadata::pvers](#) = '5.0.0'
- character(len=40), parameter [mg_metadata::pdate](#) = '30 January, 2020'
- character(len=40), parameter [mg_metadata::paut1](#) = 'CSIRO Electromagnetic Modelling Group'
- character(len=40), parameter [mg_metadata::paut2](#) = 'Zonghou Xiong, Art Raiche, David Annetts'
- character(len=40), parameter [mg_metadata::pproj](#) = 'Internal'
- integer, parameter [mg_filter_coefficients::jnlo](#) = -250
- integer, parameter [mg_filter_coefficients::jnhi](#) = 150
- integer, parameter [mg_filter_coefficients::ndec_jn](#) = 15
- integer, parameter [mg_filter_coefficients::snlo](#) = -112
- integer, parameter [mg_filter_coefficients::snhi](#) = 85
- integer, parameter [mg_filter_coefficients::ndec_sn](#) = 12
- integer [mg_filter_coefficients::j9](#)

- real `mg_filter_coefficients::shftjn`
- real, dimension(jnlo:jnhi) `mg_filter_coefficients::wj0`
- real, dimension(jnlo:jnhi) `mg_filter_coefficients::wj1`
- real, dimension(snlo:snhi) `mg_filter_coefficients::wsin`
- real `mg_filter_coefficients::delcos`
- real, dimension(-200:99) `mg_filter_coefficients::wcos`
- integer, parameter `mg_input_routines::nprop = 7`
- real, parameter `mg_input_routines::pi = 3.141592654`
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- integer `mg_input_routines::nw`
- integer `mg_input_routines::nd`
- integer `mg_input_routines::ndr`
- integer `mg_input_routines::nlg`
- integer `mg_input_routines::msg`
- integer `mg_input_routines::mxerr`
- integer `mg_input_routines::do3d`
- integer `mg_input_routines::tdfd`
- integer `mg_input_routines::step`
- integer `mg_input_routines::nsx`
- integer `mg_input_routines::prfl`
- integer `mg_input_routines::istop`
- integer `mg_input_routines::krxw`
- integer `mg_input_routines::nchnl`
- integer `mg_input_routines::nfrq`
- integer `mg_input_routines::source_type`
- integer `mg_input_routines::survey_type`
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- integer `mg_input_routines::nrxcg`
- integer `mg_input_routines::mxvrtx`
- integer `mg_input_routines::mqvr`
- integer `mg_input_routines::j`
- integer `mg_input_routines::js`
- integer `mg_input_routines::jt`
- integer `mg_input_routines::jv`
- integer `mg_input_routines::jg`
- integer `mg_input_routines::jr`
- integer `mg_input_routines::nevents`
- integer `mg_input_routines::lrx`
- integer `mg_input_routines::mrx`
- integer `mg_input_routines::nlith`
- integer `mg_input_routines::kacc`
- integer `mg_input_routines::solver`
- integer `mg_input_routines::output`
- integer `mg_input_routines::npuls`
- integer `mg_input_routines::ntyrp`
- integer `mg_input_routines::ntypls`
- integer `mg_input_routines::ntxe`
- integer `mg_input_routines::kfrqe`
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- integer, dimension(:), allocatable `mg_input_routines::units`
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- integer, dimension(:), allocatable `mg_input_routines::nrxtx`

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- integer, dimension(:,), allocatable [mg_input_routines::rxid](#)
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- integer, dimension(:,), allocatable [mg_input_routines::prtcmp](#)
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- real [mg_input_routines::reftym](#)
- real [mg_input_routines::pulse](#)
- real [mg_input_routines::rxoe](#)
- real [mg_input_routines::rxon](#)
- real [mg_input_routines::rxoz](#)
- real [mg_input_routines::rxfmnt](#)
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- real [mg_input_routines::minfrq](#)
- real [mg_input_routines::mxfrqe](#)
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- real, dimension(:), allocatable [mg_input_routines::waveform](#)
- real, dimension(:), allocatable [mg_input_routines::curnt](#)
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- real, dimension(:), allocatable [mg_input_routines::sxdip](#)
- real, dimension(:), allocatable [mg_input_routines::sxaz](#)
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- real, dimension(:,), allocatable [mg_input_routines::sxe](#)
- real, dimension(:,), allocatable [mg_input_routines::sxn](#)
- real, dimension(:,), allocatable [mg_input_routines::sxz](#)
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- real, dimension(:,), allocatable [mg_input_routines::bhdip](#)
- real, dimension(:,,:), allocatable [mg_input_routines::rxex](#)
- real, dimension(:,,:), allocatable [mg_input_routines::rxn](#)
- real, dimension(:,,:), allocatable [mg_input_routines::rxz](#)
- real(kind=8) [mg_input_routines::ecntrd](#)
- real(kind=8) [mg_input_routines::ncntrd](#)
- real(kind=8) [mg_input_routines::qd](#)
- real(kind=8), dimension(:,), allocatable [mg_input_routines::sxed](#)
- real(kind=8), dimension(:,), allocatable [mg_input_routines::sxnd](#)
- real(kind=8), dimension(:,), allocatable [mg_input_routines::sxzd](#)
- real(kind=8), dimension(:,), allocatable [mg_input_routines::clcd](#)
- real(kind=8), dimension(:,,:), allocatable [mg_input_routines::rxed](#)
- real(kind=8), dimension(:,,:), allocatable [mg_input_routines::rxnd](#)
- real(kind=8), dimension(:,,:), allocatable [mg_input_routines::rxzd](#)
- logical [mg_input_routines::new](#)
- logical [mg_input_routines::prtsec](#)

- logical, dimension(:,:), allocatable [mg_input_routines::bhr](#)
- character(len=120) [mg_input_routines::inp](#)
- character(len=120) [mg_input_routines::title](#)
- integer, dimension(8) [mg_input_routines::tvals](#)
- integer [mg_input_routines::nlyr](#)
- integer [mg_input_routines::nprism](#)
- integer [mg_input_routines::ksymm](#)
- real [mg_input_routines::gnd_lvl](#)
- real, dimension(:), allocatable [mg_input_routines::thk](#)
- real, dimension(:), allocatable [mg_input_routines::res](#)
- real, dimension(:), allocatable [mg_input_routines::rmu](#)
- real, dimension(:), allocatable [mg_input_routines::reps](#)
- real, dimension(:), allocatable [mg_input_routines::chrg](#)
- real, dimension(:), allocatable [mg_input_routines::ctau](#)
- real, dimension(:), allocatable [mg_input_routines::cfreq](#)
- real, dimension(:), allocatable [mg_input_routines::lithp](#)
- integer, dimension(:), allocatable [mg_input_routines::ncell_ew](#)
- integer, dimension(:), allocatable [mg_input_routines::ncell_ns](#)
- integer, dimension(:), allocatable [mg_input_routines::ncell_z](#)
- real, dimension(:), allocatable [mg_input_routines::prsm_res](#)
- real, dimension(:), allocatable [mg_input_routines::rmup](#)
- real, dimension(:), allocatable [mg_input_routines::repsp](#)
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- real, dimension(:), allocatable [mg_input_routines::prsm_size_ns](#)
- real, dimension(:), allocatable [mg_input_routines::prsm_size_z](#)
- real(kind=8), dimension(:), allocatable [mg_input_routines::prism_zmidd](#)
- real(kind=8), dimension(:), allocatable [mg_input_routines::prism_eastd](#)
- real(kind=8), dimension(:), allocatable [mg_input_routines::prism_northd](#)
- real, dimension(:), allocatable [mg_input_routines::prism_zmid](#)
- real, dimension(:), allocatable [mg_input_routines::prism_east](#)
- real, dimension(:), allocatable [mg_input_routines::prism_north](#)
- real [mg_input_routines::tn](#)
- real [mg_input_routines::te](#)
- integer [mg_input_routines::jb](#)
- integer [mg_input_routines::jl](#)
- integer [mg_input_routines::jp](#)
- integer, dimension(:), allocatable [mg_input_routines::lithl](#)
- integer, dimension(:), allocatable [mg_input_routines::id_lith](#)

4.1.1 Function/Subroutine Documentation

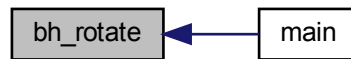
4.1.1.1 bh_rotate()

```

subroutine bh_rotate (
    integer NCHNL,
    integer LRX,
    integer NTXE,
    integer, dimension(ntxe) NRXTX,
    logical, dimension(lrx,ntxe) BHR,
    real, dimension(lrx,ntxe) DXAZ,
    real, dimension(lrx,ntxe) DXDIP,
    real, dimension(nchnl,lrx,ntxe,3) BTD )

```

Here is the caller graph for this function:



4.1.1.2 bhc_rotate()

```

subroutine bhc_rotate (
    integer NFRQ,
    integer LRX,
    integer NTXE,
    integer, dimension(ntxe) NRXTX,
    logical, dimension(lrx,ntxe) BHR,
    real, dimension(lrx,ntxe) DXAZ,
    real, dimension(lrx,ntxe) DXDIP,
    complex, dimension(nfrq,lrx,ntxe,3) BFD )

```

Here is the caller graph for this function:



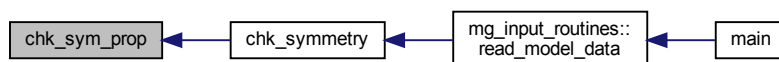
4.1.1.3 `chk_sym_prop()`

```

subroutine chk_symmetry::chk_sym_prop (
    integer L1,
    integer L2,
    real N1,
    real E1,
    integer MATCH )

```

Here is the caller graph for this function:

4.1.1.4 `chk_symmetry()`

```

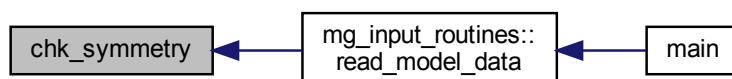
subroutine chk_symmetry (
    integer, intent(inout) NPRISM,
    integer, intent(in) NP11,
    integer, dimension(np11,2), intent(inout) LBLK,
    real, dimension(np11,9), intent(inout) PBLK,
    real, intent(out) TE,
    real, intent(out) TN,
    integer, intent(out) KSYMM )

```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.5 `compute_3d()`

```

subroutine compute_3d (
    integer, intent(in) NFRQ,
    real, dimension(nfrq), intent(in) FREQ,
    integer, intent(in) SOURCE_TYPE,
    integer, intent(in) NW,
    integer, intent(in) NTXE,
    integer, intent(in) NCRD,
    integer, dimension(NTXE), intent(in) N_VRTX,
    real, dimension(ncrd,ntxe), intent(in) TX_CRDX,
    real, dimension(ncrd,ntxe), intent(in) TX_CRDY,
    real, dimension(ncrd,ntxe), intent(in) TX_CRDZ,
    real, dimension(2,ntxe), intent(in) MD_ANGLE,
    integer, dimension(m_rx,ntxe), intent(in) RX_TYPE_INDEX,
    integer, dimension(m_rx,ntxe), intent(in) N_SUB_RX,
    real, dimension(3,sub_rx_max,m_rx,ntxe), intent(in) RX_WEIGHT,
    integer, intent(in) M_RX,
    integer, dimension(NTXE), intent(in) N_RX,
    real, dimension(sub_rx_max,m_rx,ntxe), intent(in) RX_X,
    real, dimension(sub_rx_max,m_rx,ntxe), intent(in) RX_Y,
    real, dimension(sub_rx_max,m_rx,ntxe), intent(in) RX_Z,
    integer, intent(in) SUB_RX_MAX,
    integer, intent(in) MLAYER,
    real, dimension(mlayer), intent(in) LRYTH,
    real, dimension(mlayer), intent(in) RES_LYR,
    real, dimension(mlayer), intent(in) RMU_LYR,
    real, dimension(mlayer), intent(in) RESP_LYR,
    real, dimension(mlayer), intent(in) CHRG_LYR,
    real, dimension(mlayer), intent(in) TAU_LYR,
    real, dimension(mlayer), intent(in) FRQC_LYR,
    integer, intent(in) DO3D,
    integer, intent(in) SOLVER,
    integer, intent(in) KACC,
    integer, intent(in) KSYMM,
    integer, intent(in) TRGT_BLK,
    integer, dimension(trgt_blk), intent(in) BLCK_NX,
    integer, dimension(trgt_blk), intent(in) BLCK_NY,
    integer, dimension(trgt_blk), intent(in) BLCK_NZ,
    real, dimension(trgt_blk), intent(in) BLCK_LX,
    real, dimension(trgt_blk), intent(in) BLCK_LY,
    real, dimension(trgt_blk), intent(in) BLCK_LZ,
    real, dimension(trgt_blk), intent(in) BLCK_CX,
    real, dimension(trgt_blk), intent(in) BLCK_CY,
    real, dimension(trgt_blk), intent(in) BLCK_CZ,
    real, dimension(trgt_blk), intent(in) RSB,
    real, dimension(trgt_blk), intent(in) CHRSB,
    real, dimension(trgt_blk), intent(in) TAUSB,
    real, dimension(trgt_blk), intent(in) CFRSB,
    real, dimension(trgt_blk), intent(in) RMUP,
    real, dimension(trgt_blk), intent(in) REPPSP,
    integer, intent(in) E_ONLY,
    complex, dimension(m_rx,ntxe,nfrq), intent(out) EPX,
    complex, dimension(m_rx,ntxe,nfrq), intent(out) EPY,
    complex, dimension(m_rx,ntxe,nfrq), intent(out) EPZ,
    complex, dimension(m_rx,ntxe,nfrq), intent(out) HPX,
    complex, dimension(m_rx,ntxe,nfrq), intent(out) HPY,
    complex, dimension(m_rx,ntxe,nfrq), intent(out) HPZ,

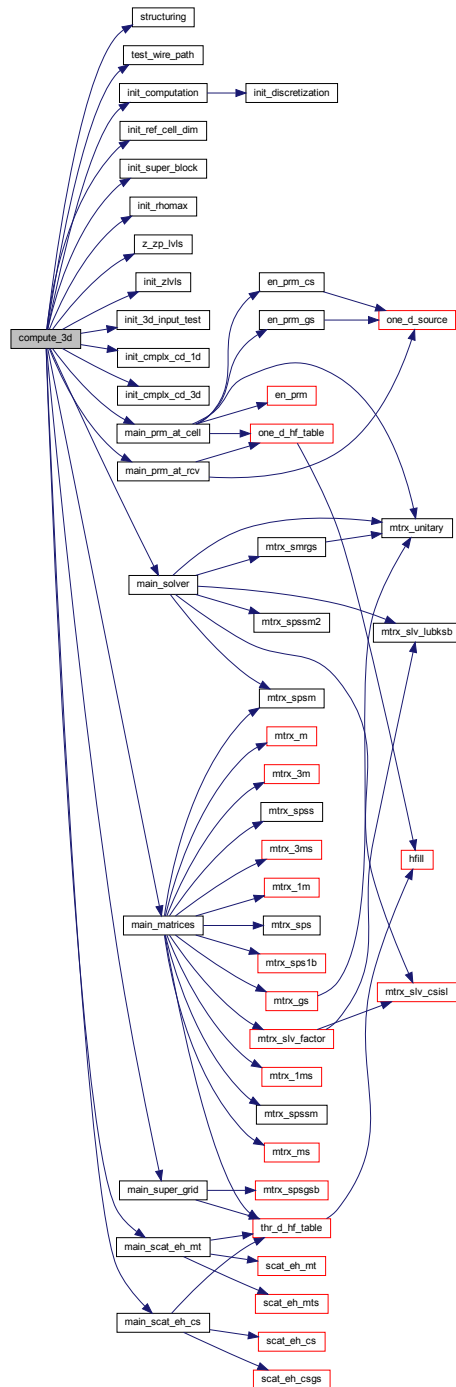
```

```

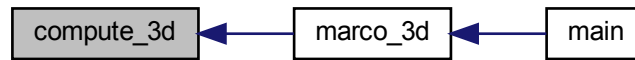
complex, dimension(m_rx,ntxe,nfrq), intent(out) VOLTP,
complex, dimension(m_rx,ntxe,nfrq), intent(out) E3X,
complex, dimension(m_rx,ntxe,nfrq), intent(out) E3Y,
complex, dimension(m_rx,ntxe,nfrq), intent(out) E3Z,
complex, dimension(m_rx,ntxe,nfrq), intent(out) H3X,
complex, dimension(m_rx,ntxe,nfrq), intent(out) H3Y,
complex, dimension(m_rx,ntxe,nfrq), intent(out) H3Z,
complex, dimension(m_rx,ntxe,nfrq), intent(out) VOLT3 )

```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.6 costrn()

```

real function costrn (
    real, dimension(nfrq), intent(in) WF,
    real, dimension(4,nfrq), intent(in) YFRQ,
    integer, intent(in) NFRQ,
    integer KFRQ,
    real, intent(in) T )
  
```

4.1.1.7 cubint()

```

real function cubint (
    real, dimension(knot) XKNOT,
    real, dimension(4,knot) COEF,
    integer KNOT,
    real X1,
    real X2 )
  
```

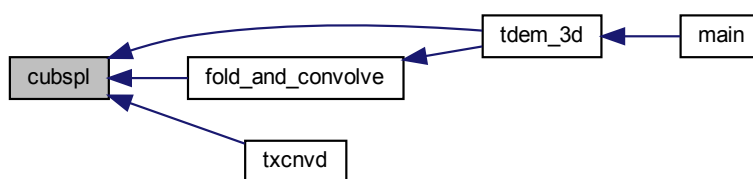
Here is the call graph for this function:



4.1.1.8 cubspl()

```
subroutine cubspl (  
    real, dimension(n), intent(in) XNOT,  
    real, dimension(4,n), intent(inout) C,  
    integer, intent(in) N,  
    integer, intent(in) IBCBEG,  
    integer, intent(in) IBCEND )
```

Here is the caller graph for this function:



4.1.1.9 cubval()

```
real function cubval (  
    real, dimension(knot), intent(in) XKNOT,  
    real, dimension(4,knot), intent(in) COEF,  
    integer, intent(in) KNOT,  
    real, intent(in) X1 )
```

Here is the call graph for this function:



4.1.1.10 en_prm()

```

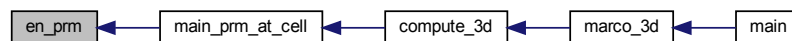
subroutine en_prm (
    real FRQ,
    integer MLAYER,
    real, dimension(0:mlayer) ZBND,
    real, dimension(mlayer) LRYTH,
    complex, dimension(0:mlayer) KKH,
    complex, dimension(0:mlayer) CDH,
    integer NET,
    integer SUB_BLOCK,
    integer NSUBCM,
    integer NZMAX,
    integer, dimension(sub_block) NX,
    integer, dimension(sub_block) NY,
    integer, dimension(sub_block) NZ,
    integer, dimension(sub_block) NCELL,
    real, dimension(nzmax,sub_block) ZCELL,
    complex, dimension(nsubcm,sub_block) CDB,
    integer KPOL,
    complex, dimension(net) EN,
    complex, dimension(net) ECD )

```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.11 en_prm_cs()

```

subroutine en_prm_cs (
    integer NET,
    integer SUB_BLOCK,
    integer NSUBCM,
    integer NXMAX,

```

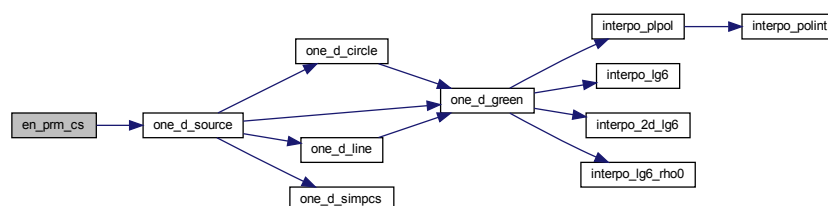


```

integer NYMAX,
integer NZMAX,
integer, dimension(sub_block) NX,
integer, dimension(sub_block) NY,
integer, dimension(sub_block) NZ,
integer, dimension(sub_block) NCELL,
real, dimension(nxmax,sub_block) XCELL,
real, dimension(nymax,sub_block) YCELL,
real, dimension(nzmax,sub_block) ZCELL,
complex, dimension(nsubcm,sub_block) CDB,
integer CS_TYPE,
integer NCRD,
real, dimension(ncrd) TX_CRDX,
real, dimension(ncrd) TX_CRDY,
real, dimension(ncrd) TX_CRDZ,
real RAD,
complex, dimension(net) EN,
complex, dimension(net) ECD,
real FRQ,
integer MLAYER,
real, dimension(0:mayer) ZBND,
complex, dimension(0:mayer) KKH,
complex, dimension(0:mayer) CDH,
real, dimension(2) ANGLES,
integer KEYG,
integer KACC,
real AJ,
integer NZOB,
real, dimension(nzob) ZOBG,
integer NZSR,
real, dimension(2,nzsr) ZSRG,
real RHOMIN,
integer NHFILM,
real, dimension(nrg) RRG,
integer NRG,
complex, dimension(11,nhfilm,nzsr,nzob) GRHF,
complex, dimension(4,nzsr,nzob) GRH00 )

```

Here is the call graph for this function:



Here is the caller graph for this function:

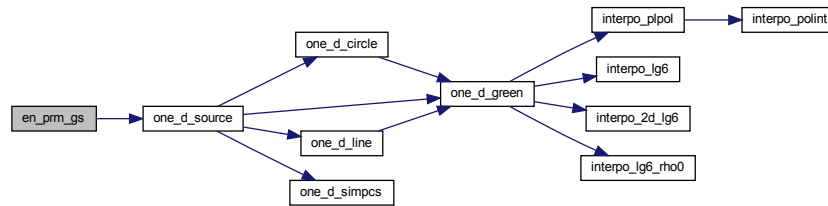


4.1.1.12 en_prm_gs()

```

subroutine en_prm_gs (
    integer NEQ,
    integer NBODY,
    integer, dimension(nbody) SUB_BLOCK,
    integer NBMAX,
    integer NXMAX,
    integer NYMAX,
    integer NZMAX,
    integer, dimension(nbody) NET,
    integer, dimension(nbmax,nbody) NX,
    integer, dimension(nbmax,nbody) NY,
    integer, dimension(nbmax,nbody) NZ,
    integer, dimension(nbmax,nbody) NCELL,
    real, dimension(nxmax,nbmax,nbody) XCELL,
    real, dimension(nymax,nbmax,nbody) YCELL,
    real, dimension(nzmax,nbmax,nbody) ZCELL,
    integer CS_TYPE,
    integer NCRD,
    real, dimension(ncrd) TX_CRDX,
    real, dimension(ncrd) TX_CRDY,
    real, dimension(ncrd) TX_CRDZ,
    real RAD,
    complex, dimension(neq*4) EN,
    real FRQ,
    integer MLAYER,
    real, dimension(0:mlayer) ZBND,
    complex, dimension(0:mlayer) KKH,
    complex, dimension(0:mlayer) CDH,
    real, dimension(2) ANGLES,
    integer KEYG,
    integer KACC,
    real AJ,
    integer NZOB,
    real, dimension(nzob) ZOBG,
    integer NZSR,
    real, dimension(2,nzsr) ZSRG,
    real RHOMIN,
    integer NHFILM,
    real, dimension(nrg) RRG,
    integer NRG,
    complex, dimension(11,nhfilm,nzsr,nzob) GRHF,
    complex, dimension(4,nzsr,nzob) GRH00 )
  
```

Here is the call graph for this function:



Here is the caller graph for this function:

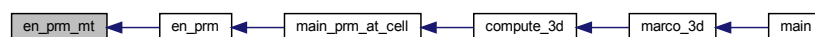


4.1.1.13 en_prm_mt()

```

subroutine en_prm_mt (
    real FRQ,
    integer MLAYER,
    real, dimension(0:mlayer) ZBND,
    real, dimension(mlayer) LRYTH,
    complex, dimension(0:mlayer) KKH,
    integer NOBSV,
    real ZOB,
    complex EX,
    complex EY,
    complex HX,
    complex HY )
  
```

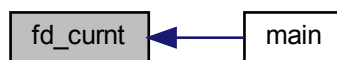
Here is the caller graph for this function:



4.1.1.14 fd_curnt()

```
subroutine fd_curnt (  
    integer NFRQ,  
    integer LRX,  
    integer NTXE,  
    real, dimension(nfrq) CURNT,  
    complex, dimension(nfrq,lrx,ntxe,3) RFD )
```

Here is the caller graph for this function:



4.1.1.15 fdread()

```
subroutine fdread (  
    integer ND,  
    integer NFRQ,  
    integer NTXE,  
    integer LRX,  
    integer, dimension(ntxe) NRXTX,  
    integer, dimension(lrx,ntxe) NCMP,  
    complex, dimension(nfrq,lrx,ntxe,3) BFD,  
    complex, dimension(nfrq,lrx,ntxe,3) BFD_SCAT,  
    integer OUTPUT )
```

Here is the caller graph for this function:



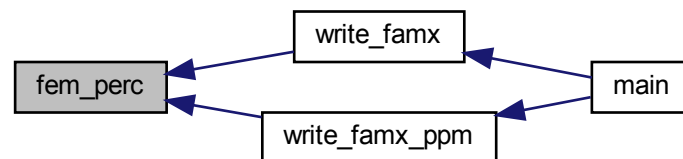
4.1.1.16 fem_perc()

```

subroutine fem_perc (
    integer, intent(in) NFRQ,
    integer, intent(in) NSTNS,
    complex, dimension(nfrq, nstns), intent(in) NUM,
    complex, dimension(nfrq, nstns), intent(in) DEN,
    complex, dimension(nfrq, nstns), intent(out) PRC )

```

Here is the caller graph for this function:



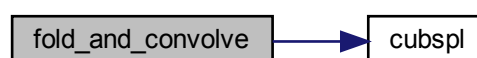
4.1.1.17 fold_and_convolve()

```

subroutine fold_and_convolve (
    integer STEPC,
    integer NSX,
    real, dimension(nsx) SWX,
    real, dimension(nsx,3) SWY,
    integer NPULS,
    real PULSE,
    real, dimension(ntyrrp) TRP,
    integer NTYRP,
    integer NTYPLS,
    integer NCHNL,
    real, dimension(nchnl) TOPN,
    real, dimension(nchnl) TCLS,
    real, dimension(4,ntyrrp) YPLS,
    real, dimension(nchnl) YCUM )

```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.18 hfilh()

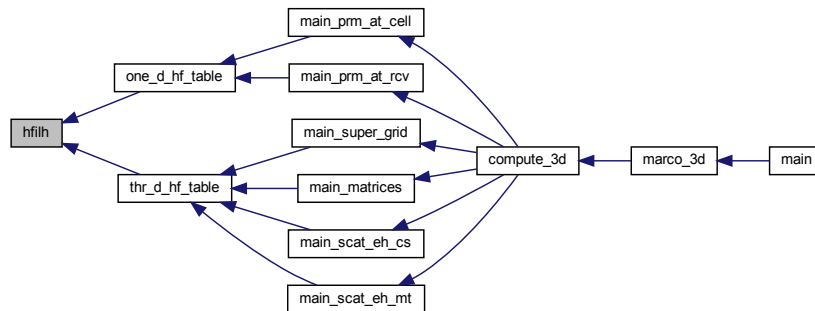
```

subroutine hfilh (
    integer, intent(in) KEYG,
    integer, intent(in) KEMD,
    integer, intent(in) MLAYER,
    real, dimension(0:mlayer), intent(in) ZBND,
    real, dimension(mlayer), intent(in) LRYTH,
    real, dimension(0:mlayer), intent(in) HVK,
    complex, dimension(0:mlayer), intent(in) KKH,
    integer, intent(in) KANIS,
    integer, intent(in) KPRM,
    integer, intent(in) KITG,
    integer, intent(in) KCHRG,
    integer, intent(in) NOB,
    integer, intent(in) NSR,
    real, intent(in) RLO,
    real, intent(in) RHI,
    real, intent(in) ZOB,
    real, intent(in) ZSRH,
    real, intent(in) ZSRL,
    integer, intent(out) NRG,
    real, dimension(nhfilm), intent(out) RRG,
    complex, dimension(11,nhfilm), intent(out) HF,
    integer, intent(in) NHFILM )
  
```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.19 hfill()

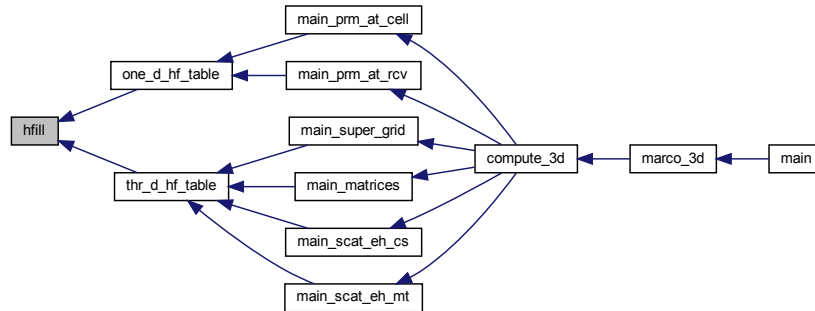
```

subroutine hfill (
    integer, intent(in) KEYG,
    integer, intent(in) KEMD,
    integer, intent(in) MLAYER,
    real, dimension(0:mlayer), intent(in) ZBND,
    real, dimension(mlayer), intent(in) LRYTH,
    real, dimension(0:mlayer), intent(in) HVK,
    complex, dimension(0:mlayer), intent(in) KKH,
    integer, intent(in) KANIS,
    integer, intent(in) KPRM,
    integer, intent(in) KITG,
    integer, intent(in) KCHRG,
    integer, intent(in) NOB,
    integer, intent(in) NSR,
    real, intent(in) RLO,
    real, intent(in) RHI,
    real, intent(in) ZOB,
    real, intent(in) ZSRH,
    real, intent(in) ZSRL,
    integer, intent(out) NRG,
    real, dimension(nhfilm), intent(out) RRG,
    complex, dimension(11,nhfilm), intent(inout) HF,
    integer, intent(in) NHFILM )
  
```

Here is the call graph for this function:



Here is the caller graph for this function:

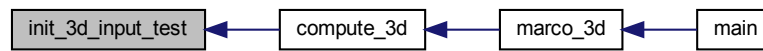


4.1.1.20 init_3d_input_test()

```

subroutine init_3d_input_test (
    integer NW,
    integer KAUTO,
    integer KSYMM,
    real DMIN,
    integer NSUBCM,
    integer MBODY,
    integer NBMAX,
    integer NXMAX,
    integer NYMAX,
    integer NZMAX,
    integer NBODY,
    integer TRGT_BLOCK,
    real, dimension(trgt_blk) BLCK_LX,
    real, dimension(trgt_blk) BLCK_LY,
    real, dimension(trgt_blk) BLCK_LZ,
    real, dimension(trgt_blk) BLCK_CX,
    real, dimension(trgt_blk) BLCK_CY,
    real, dimension(trgt_blk) BLCK_CZ,
    integer, dimension(mbody) NCT,
    integer, dimension(mbody) SUB_BLOCK,
    integer, dimension(nbmax,mbody) NX,
    integer, dimension(nbmax,mbody) NY,
    integer, dimension(nbmax,mbody) NZ,
    real, dimension(nbmax,mbody) BLX,
    real, dimension(nbmax,mbody) BLY,
    real, dimension(nbmax,mbody) BLZ,
    real, dimension(nbmax,mbody) XBL,
    real, dimension(nbmax,mbody) YBL,
    real, dimension(nbmax,mbody) ZBL,
    integer MLAYER,
    real, dimension(0:mayer) ZBND,
    real, dimension(nzmax,nbmax,mbody) ZCELL )
  
```


Here is the caller graph for this function:

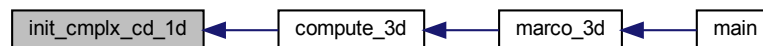


4.1.1.21 init_cmplx_cd_1d()

```

subroutine init_cmplx_cd_1d (
    integer NW,
    real FRQ,
    integer COLE_COLE,
    integer MLAYER,
    integer KANIS,
    real, dimension(0:mlayer) HVK,
    real, dimension(mlayer) RES_LYR,
    real, dimension(mlayer) CHRG_LYR,
    real, dimension(mlayer) TAU_LYR,
    real, dimension(mlayer) FRQC_LYR,
    real, dimension(mlayer) RMU_LYR,
    real, dimension(mlayer) RESP_LYR,
    real, dimension(mlayer) DCHRG_LYR,
    real, dimension(mlayer) DTAU_LYR,
    real, dimension(mlayer) DFRQC_LYR,
    complex, dimension(0:mlayer) CDH,
    complex, dimension(0:mlayer) CDV,
    complex, dimension(0:mlayer) KKH )
  
```

Here is the caller graph for this function:



4.1.1.22 init_cmplx_cd_3d()

```

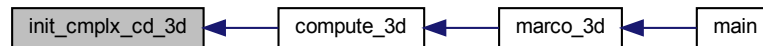
subroutine init_cmplx_cd_3d (
    real FRQ,
    integer COLE_COLE,
    integer NBMAX,
  
```

```

integer NBODY,
integer, dimension(nbody) SUB_BLOCK,
integer, dimension(nbmax,nbody) NCELL,
real, dimension(nbmax,nbody) BLZ,
real, dimension(0:nlayer) ZBND,
integer NLAYER,
real, dimension(nlayer) RMU,
integer NSUBCM,
complex, dimension(nsubcm,nbmax) CDB,
real, dimension(nbmax,nbody) RBC,
real, dimension(nbmax,nbody) CHRBC,
real, dimension(nbmax,nbody) TAUBC,
real, dimension(nbmax,nbody) CFRBC,
real, dimension(nbmax,nbody) DEBC,
real, dimension(nbmax,nbody) RMUB )

```

Here is the caller graph for this function:



4.1.1.23 init_computation()

```

subroutine init_computation (
    real DMIN,
    integer MBODY,
    integer NBMAX,
    integer NXMAX,
    integer NYMAX,
    integer NZMAX,
    integer CS_TYPE,
    integer KSYMM,
    integer NTXE,
    integer SUB_RX_MAX,
    integer M_RX,
    integer, dimension(ntaxe) N_RX,
    integer, dimension(m_rx,ntaxe) N_SUB_RX,
    real, dimension(sub_rx_max,m_rx,ntaxe), intent(in) RX_X,
    real, dimension(sub_rx_max,m_rx,ntaxe), intent(in) RX_Y,
    real, dimension(sub_rx_max,m_rx,ntaxe), intent(in) RX_Z,
    real ZMT,
    integer MT_PROFL,
    integer MT_STATN,
    real, dimension(mt_profl) XRMT,
    real, dimension(mt_statn) YRMT,
    integer NBODY,
    integer, dimension(mbody) SUB_BLOCK,
    integer, dimension(nbmax,mbody) NX,

```

```

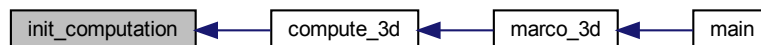
integer, dimension(nbmax,mbody) NY,
integer, dimension(nbmax,mbody) NZ,
real, dimension(nbmax,mbody) BLX,
real, dimension(nbmax,mbody) BLY,
real, dimension(nbmax,mbody) BLZ,
real, dimension(nbmax,mbody) XBL,
real, dimension(nbmax,mbody) YBL,
real, dimension(nbmax,mbody) ZBL,
real, dimension(nxmax) Xl,
real, dimension(nymax) Yl,
real, dimension(nzmax) Zl,
integer, dimension(mbody) NCT,
integer, dimension(mbody) NET,
integer, dimension(nbmax,mbody) NCELL,
integer NCTT,
integer NEQ,
real, dimension(nxmax,nbmax,mbody) XCELL,
real, dimension(nymax,nbmax,mbody) YCELL,
real, dimension(nzmax,nbmax,mbody) ZCELL,
integer, dimension(mbody) KCELL,
integer KBOUND,
integer MLAYER,
real, dimension(0:mlayer) ZBND,
integer KSFT,
integer, dimension(nbmax,mbody) KEYSF,
integer KGHP,
real BLMIN )

```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.24 init_discretization()

```

subroutine init_discretization (
    real BLX,

```

```

real BLY,
real BLZ,
integer NX,
integer NY,
integer NZ,
real XCD,
real YCD,
real ZCD,
real, dimension(nx) X,
real, dimension(ny) Y,
real, dimension(nz) Z )

```

Here is the caller graph for this function:



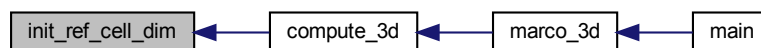
4.1.1.25 init_ref_cell_dim()

```

subroutine init_ref_cell_dim (
    integer NW,
    integer MBODY,
    integer NBMAX,
    integer NBODY,
    integer, dimension(mbody) SUB_BLOCK,
    real, dimension(nbmax,mbody) BLX,
    real, dimension(nbmax,mbody) BLY,
    real, dimension(nbmax,mbody) BLZ,
    real DMIN,
    integer KCLMN,
    real, dimension(mbody) CLMN )

```

Here is the caller graph for this function:



4.1.1.26 init_rhmax()

```

subroutine init_rhmax (
    integer DO3D,
    integer MBODY,
    integer NBMAX,
    integer NXMAX,
    integer NYMAX,
    integer KSYMM,
    integer NBODY,
    integer, dimension(mbody) SUB_BLOCK,
    integer, dimension(nbmax,mbody) NX,
    integer, dimension(nbmax,mbody) NY,
    real, dimension(nxmax,nbmax,mbody) XCELL,
    real, dimension(nymax,nbmax,mbody) YCELL,
    real, dimension(nbmax,mbody) BLX,
    real, dimension(nbmax,mbody) BLY,
    integer NTXE,
    integer NCRD,
    real, dimension(ncrd,ntxe) TX_CRDX,
    real, dimension(ncrd,ntxe) TX_CRDY,
    integer, dimension(ntxe) N_RX,
    real, dimension(sub_rx_max,m_rx,ntxe) RX_X,
    real, dimension(sub_rx_max,m_rx,ntxe) RX_Y,
    integer SUB_RX_MAX,
    integer, dimension(m_rx,ntxe) N_SUB_RX,
    integer M_RX,
    real RHOMIN,
    real RMAX1,
    real RMIN1,
    real RMAX2,
    real RMIN2 )

```

Here is the caller graph for this function:



4.1.1.27 init_super_block()

```

subroutine init_super_block (
    integer NW,
    integer MBODY,
    integer NBMAX,
    integer NSMR,
    integer KSYMM,
    real DMIN,

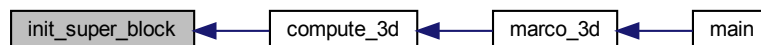
```

```

integer NXMAX,
integer NYMAX,
integer NZMAX,
integer NBODY,
integer, dimension(mbody) SUB_BLOCK,
real, dimension(nbmax,mbody) BLX,
real, dimension(nbmax,mbody) BLY,
real, dimension(nbmax,mbody) BLZ,
integer, dimension(nbmax,mbody) NX,
integer, dimension(nbmax,mbody) NY,
integer, dimension(nbmax,mbody) NZ,
real, dimension(nbmax,mbody) XBL,
real, dimension(nbmax,mbody) YBL,
real, dimension(nbmax,mbody) ZBL,
real, dimension(nxmax,nbmax,mbody) XCELL,
real, dimension(nymax,nbmax,mbody) YCELL,
real, dimension(nzmax,nbmax,mbody) ZCELL,
real SBX,
real SBY,
real SBZ,
real XSB,
real YSB,
real ZSB,
real SCX,
real SCY,
real SCZ,
integer NXs,
integer NYS,
integer NZS,
integer KSMR )

```

Here is the caller graph for this function:



4.1.1.28 init_zlvls()

```

subroutine init_zlvls (
    integer, intent(in) NW,
    integer, intent(in) MBODY,
    integer, intent(in) NBMAX,
    integer, intent(in) NZMAX,
    integer, intent(in) KSMR,
    integer, intent(in) NBODY,
    integer, dimension(mbody), intent(in) SUB_BLOCK,
    integer, intent(in) NZS,
    integer, dimension(nbmax,mbody), intent(in) NZ,

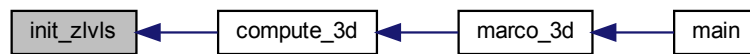
```

```

real, intent(in) SBZ,
real, intent(in) SCZ,
real, intent(in) ZSB,
real, dimension(nzmax,nbmax,mbody), intent(in) ZCELL,
real, dimension(nbmax,mbody), intent(in) BLZ,
integer, intent(in) MZGRID,
real, intent(in) DMIN,
integer, intent(out) NZSR,
real, dimension(2,mzgrid), intent(out) ZSRG,
integer, intent(out) NZOB,
real, dimension(mzgrid), intent(out) ZOBG )

```

Here is the caller graph for this function:



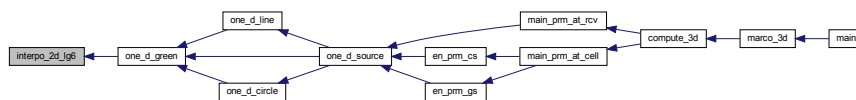
4.1.1.29 interpo_2d_lg6()

```

subroutine interpo_2d_lg6 (
    complex, dimension(11,nhfilm,nzsr,nzob) GRHF,
    real, dimension(1) A,
    integer L,
    integer NHFILM,
    integer NZSR,
    integer NZOB,
    real X,
    integer IOB,
    real ZSR,
    real, dimension(2,nzsr) ZSRG,
    complex, dimension(nf) F,
    integer NF )

```

Here is the caller graph for this function:



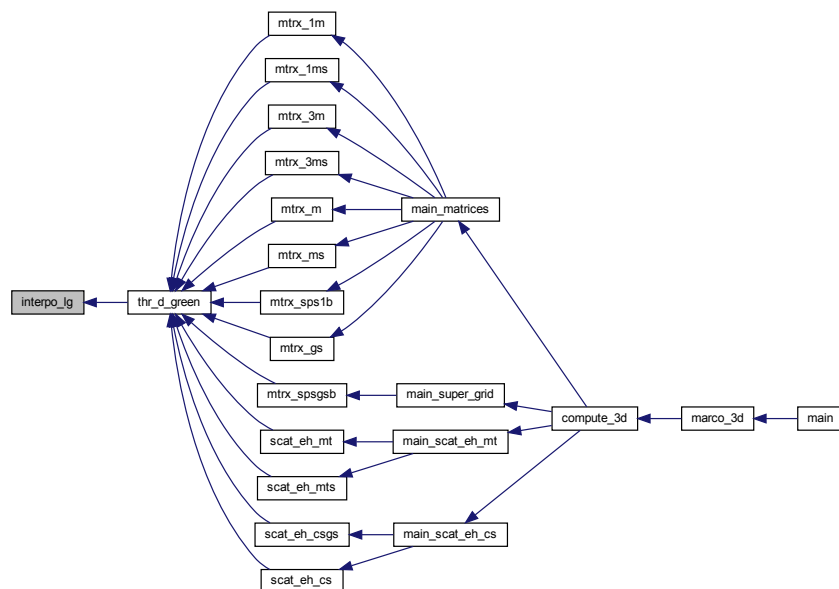
4.1.1.30 `interpo_lg()`

```

subroutine interpo_lg (
    complex, dimension(11,nhfilm,nzsr,nzob) GRHF,
    real, dimension(1) A,
    integer L,
    integer NHFILM,
    integer NZSR,
    integer NZOB,
    real X,
    integer IOB,
    integer ISR,
    complex, dimension(nf) F,
    integer NF )

```

Here is the caller graph for this function:

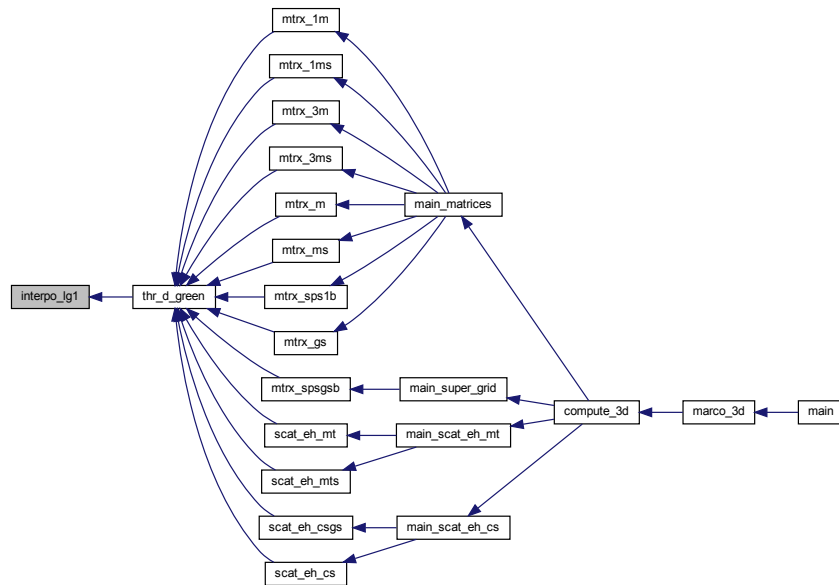
4.1.1.31 `interpo_lg1()`

```

subroutine interpo_lg1 (
    complex, dimension(11,nhfilm,nzsr) GRHF3,
    real, dimension(1) A,
    integer L,
    integer NHFILM,
    integer NZSR,
    real X,
    integer ISR,
    complex, dimension(nf) F,
    integer NF )

```


Here is the caller graph for this function:

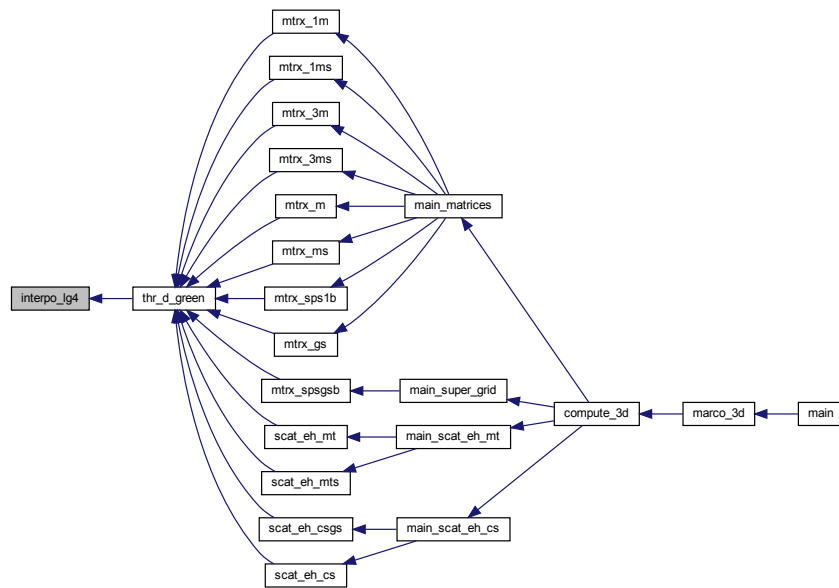


4.1.1.32 interpo_lg4()

```

subroutine interpo_lg4 (
    complex, dimension(11,nhfilm,nzsr,nzob) GRHF,
    real, dimension(1) A,
    integer L,
    integer NHFILM,
    integer NZSR,
    integer NZOB,
    real X,
    integer IOB,
    integer ISR,
    complex, dimension(nf) F,
    integer NF )
  
```

Here is the caller graph for this function:



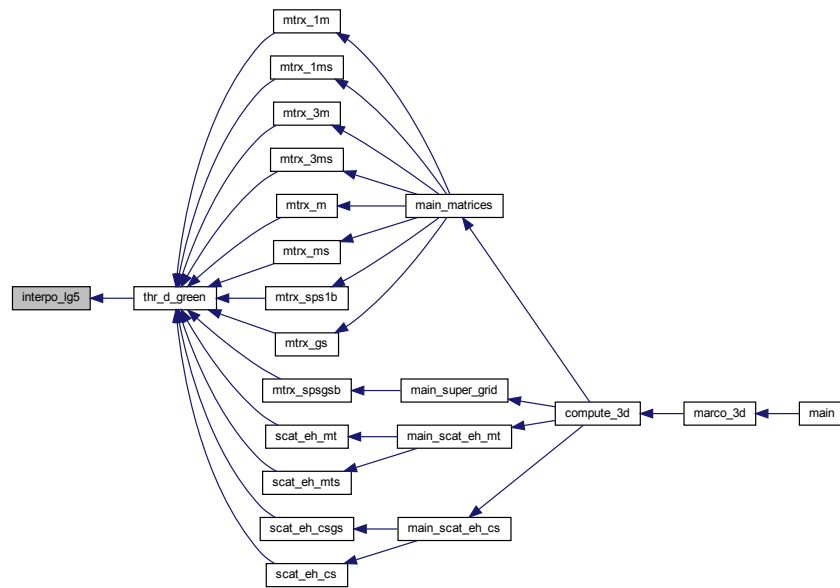
4.1.1.33 interpo_lg5()

```

subroutine interpo_lg5 (
    complex, dimension(11,nhfilm,nzsr) GRHF3,
    real, dimension(1) A,
    integer L,
    integer NHFILM,
    integer NZSR,
    real X,
    integer ISR,
    complex, dimension(nf) F,
    integer NF )

```

Here is the caller graph for this function:



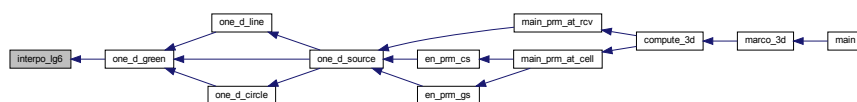
4.1.1.34 `interpo_lg6()`

```

subroutine interpo_lg6 (
    complex, dimension(11,nhfilm,nzsr,nzob) GRHF,
    real, dimension(1) A,
    integer L,
    integer NHFILM,
    integer NZSR,
    integer NZOB,
    real X,
    integer IOB,
    integer ISR,
    complex, dimension(nf) F,
    integer NF )

```

Here is the caller graph for this function:



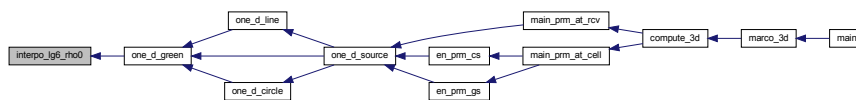
4.1.1.35 interpo_lg6_rho0()

```

subroutine interpo_lg6_rho0 (
    complex, dimension(4,nzsr,nzob) GRH00,
    integer NZSR,
    integer NZOB,
    integer IOB,
    real ZSR,
    real, dimension(2,nzsr) ZSRG,
    complex, dimension(nf) F,
    integer NF )

```

Here is the caller graph for this function:



4.1.1.36 interpo_plpol()

```

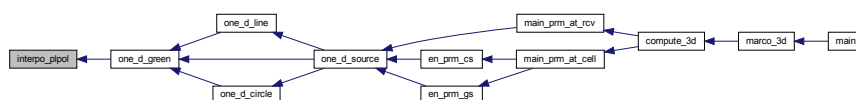
subroutine interpo_plpol (
    complex, dimension(11,nhfilm,nzsr,nzob), intent(in) GRHF,
    real, dimension(1), intent(in) A,
    integer, intent(in) L,
    integer, intent(in) NHFILM,
    integer, intent(in) NZSR,
    integer, intent(in) NZOB,
    real X,
    integer, intent(in) IOB,
    integer, intent(in) ISR,
    complex, dimension(nf), intent(out) F,
    integer, intent(in) NF )

```

Here is the call graph for this function:



Here is the caller graph for this function:



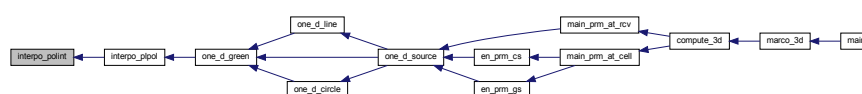
4.1.1.37 `interpo_polint()`

```

subroutine interpo_polint (
    real, dimension(n) XA,
    complex, dimension(n) YA,
    integer N,
    real X,
    complex Y,
    complex DY )

```

Here is the caller graph for this function:

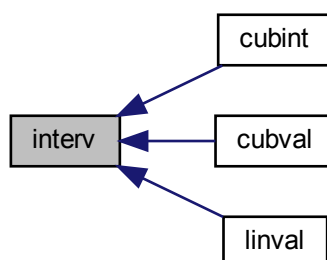
4.1.1.38 `interv()`

```

subroutine interv (
    real, dimension(lxt) XT,
    integer LXT,
    real X,
    integer LEFT,
    integer MFLAG )

```

Here is the caller graph for this function:



4.1.1.39 isamax()

```
integer function isamax (
    integer N,
    complex, dimension(n) SX,
    integer INCX )
```

4.1.1.40 linval()

```
real function linval (
    integer, intent(in) NX,
    real, dimension(nx), intent(in) XVAL,
    real, dimension(nx,3), intent(in) YVAL,
    integer KI,
    real, intent(in) XI )
```

Here is the call graph for this function:



4.1.1.41 lp_vertex_order()

```
subroutine lp_vertex_order (
    integer NTXE,
    integer MXVRTX,
    integer, dimension(ntaxe) N_VRTX,
    real, dimension (mxvrtx,ntaxe) SXN,
    real, dimension (mxvrtx,ntaxe) SXE,
    real, dimension (mxvrtx,ntaxe) SXZ )
```

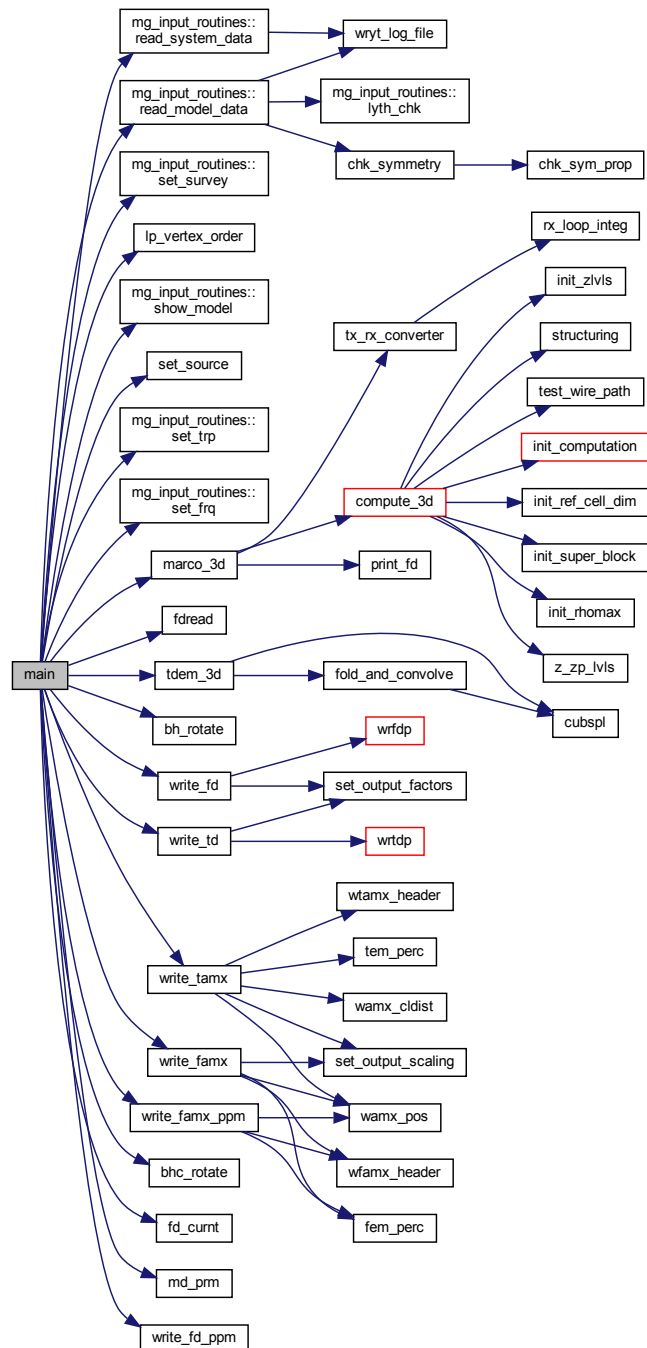
Here is the caller graph for this function:



4.1.1.42 main()

```
program main ( )
```

Here is the call graph for this function:



4.1.1.43 main_matrices()

```

subroutine main_matrices (
    integer NW,
    integer HIGH_FRQ,
    integer NPOL,
    integer KSMR,
    real, dimension(nbody) CLMN,
    integer KANIS,
    integer KBOUND,
    integer KSYMM,
    integer CS_TYPE,
    integer KCOND,
    complex, dimension(nmax,nmax) GA,
    complex, dimension(nsmr/3,3) GSB2,
    integer, dimension(nmax) IND,
    real, dimension(nmax) VV,
    real, dimension(nmax) GAI,
    complex, dimension(nmax) EN,
    complex, dimension(nmax) EMT,
    complex, dimension(nsubcm,nbmax) CDB,
    integer MBODY,
    integer NBMAX,
    integer NXMAX,
    integer NYMAX,
    integer NZMAX,
    integer NSUBCM,
    integer NBODY,
    integer, dimension(mbody) SUB_BLOCK,
    integer, dimension(mbody) NET,
    integer, dimension(nbmax,mbody) NX,
    integer, dimension(nbmax,mbody) NY,
    integer, dimension(nbmax,mbody) NZ,
    integer, dimension(nbmax,mbody) NCELL,
    real, dimension(nbmax,mbody) BLX,
    real, dimension(nbmax,mbody) BLY,
    real, dimension(nbmax,mbody) BLZ,
    real, dimension(nxmax,nbmax,mbody) XCELL,
    real, dimension(nymax,nbmax,mbody) YCELL,
    real, dimension(nzmax,nbmax,mbody) ZCELL,
    integer, dimension(mbody) KCELL,
    integer NEQ,
    integer NMAX,
    integer, dimension(nbmax) NXI,
    integer, dimension(nbmax) NYI,
    integer, dimension(nbmax) NZI,
    integer, dimension(nbmax) NCELLI,
    real, dimension(nbmax) BLXI,
    real, dimension(nbmax) BLYI,
    real, dimension(nbmax) BLZI,
    real, dimension(nxmax,nbmax) XCELLI,
    real, dimension(nymax,nbmax) YCELLI,
    real, dimension(nzmax,nbmax) ZCELLI,
    integer, dimension(nbmax) NXJ,
    integer, dimension(nbmax) NYJ,
    integer, dimension(nbmax) NZJ,
    integer, dimension(nbmax) NCELLJ,
    real, dimension(nxmax,nbmax) XCELLJ,

```

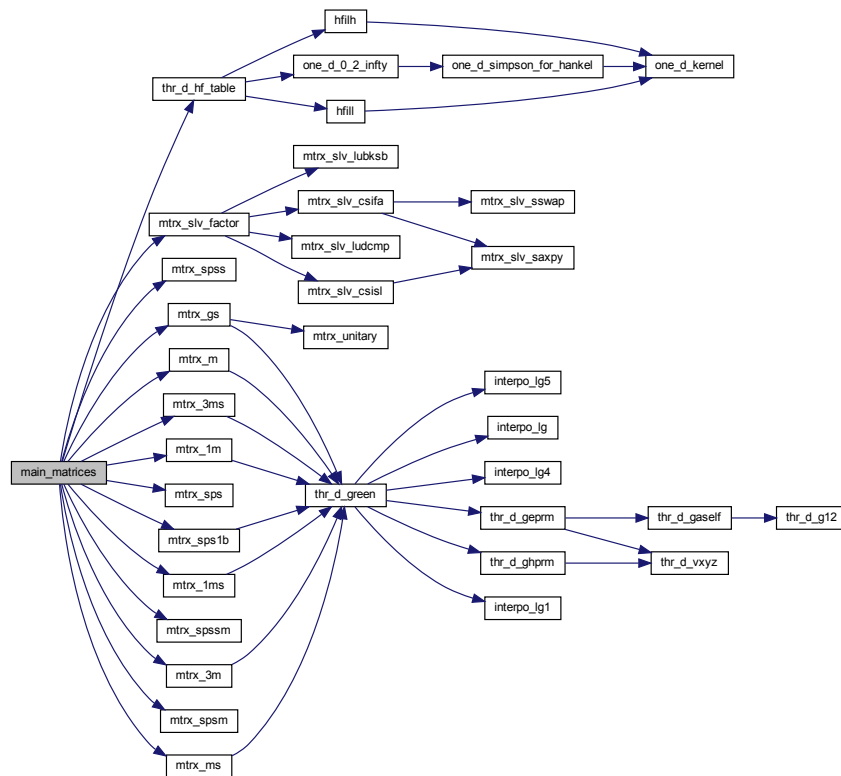


```

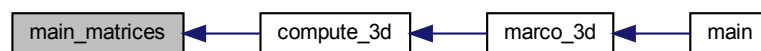
real, dimension(nymax,nbmax) YCELLJ,
real, dimension(nzmax,nbmax) ZCELLJ,
real SBX,
real SBY,
real SBZ,
integer NXS,
integer NYS,
integer NZS,
real ZSB,
integer NSMR,
real FRQ,
integer MLAYER,
real, dimension(0:mlayer) ZBND,
real, dimension(mlayer) LRYTH,
complex, dimension(0:mlayer) KKH,
complex, dimension(0:mlayer) CDH,
complex, dimension(0:mlayer) CDV,
real, dimension(0:mlayer) HVK,
integer NZOB,
real, dimension(nzob) ZOBG,
integer NZSR,
real, dimension(2,nzsr) ZSRG,
real DMIN,
integer NHFILM,
real RHOMIN,
real RHOMAX,
real, dimension(nhfilm) RRG,
real, dimension(nhfilm) RRG3,
complex, dimension(11,nhfilm,nzsr,nzob) GRHF,
complex, dimension(11,nhfilm,nzsr) GRHF3,
complex, dimension(4,nzsr,nzob) GRH00,
complex, dimension(4,nzsr) GRH003,
real ALMAX,
integer KSFT,
integer KCLMN,
real BLMIN,
integer KACC,
integer KUTCPR )

```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.44 main_prm_at_cell()

```

subroutine main_prm_at_cell (
    integer NW,
    real FRQ,
    integer MLAYER,
    real, dimension(0:mlayer) ZBND,
    real, dimension(mlayer) LRYTH,
    real, dimension(0:mlayer) HVK,
    complex, dimension(0:mlayer) KKH,
    complex, dimension(0:mlayer) CDH,

```

```

integer KANIS,
integer HIGH_FRQ,
integer CS_TYPE,
integer KSYMM,
integer MBODY,
integer NBMAX,
integer NSUBCM,
integer NMAX,
integer NXMAX,
integer NYMAX,
integer NZMAX,
integer NTXE,
real, dimension(2,ntxe) MD_ANGLE,
integer NCRD,
integer, dimension(ntxe) N_VRTX,
real, dimension(ncrd,ntxe) TX_CRDX,
real, dimension(ncrd,ntxe) TX_CRDY,
real, dimension(ncrd,ntxe) TX_CRDZ,
real, dimension(ntxe) RAD,
integer NPOL,
integer LP1,
integer LP2,
integer NBODY,
integer, dimension(mbody) SUB_BLOCK,
integer, dimension(mbody) NET,
integer NEQ,
integer, dimension(nbmax,mbody) NX,
integer, dimension(nbmax,mbody) NY,
integer, dimension(nbmax,mbody) NZ,
integer, dimension(nbmax,mbody) NCELL,
real, dimension(nxmax,nbmax,mbody) XCELL,
real, dimension(nymax,nbmax,mbody) YCELL,
real, dimension(nzmax,nbmax,mbody) ZCELL,
integer, dimension(nbmax) NXI,
integer, dimension(nbmax) NYI,
integer, dimension(nbmax) NZI,
integer, dimension(nbmax) NCELLI,
real, dimension(nxmax,nbmax) XCELLI,
real, dimension(nymax,nbmax) YCELLI,
real, dimension(nzmax,nbmax) ZCELLI,
complex, dimension(nsubcm,nbmax) CDB,
complex, dimension(nmax) EN,
complex, dimension(nmax) EMT,
complex, dimension(nmax,nbody) ENT,
complex, dimension(4*nmax*mbody) EJGS,
complex, dimension(4*nmax*mbody) EJGS2,
real RHOMIN,
real RHOMAX,
integer NZOB,
real, dimension(nzob) ZOBG,
integer NZSR,
real, dimension(2,nzsr) ZSRG,
integer NZBG,
real, dimension(2,nzbg) ZBG,
integer KACC,
real AJ,
real DMIN,
integer NHFILM,

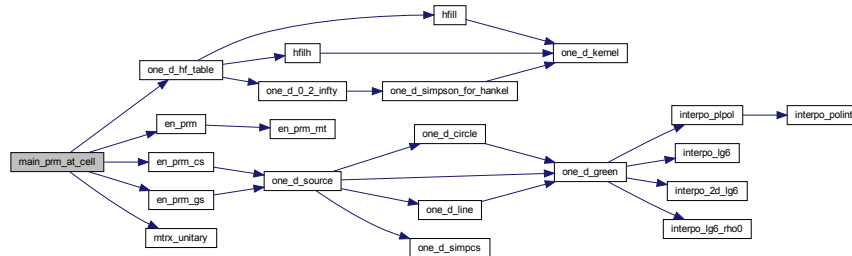
```

```

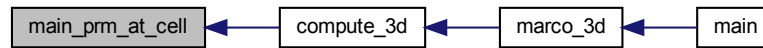
real ALMAX,
real BLMIN,
complex, dimension(11,nhfilm,nzsr,nzob) GRHF,
real, dimension(nhfilm) RRG,
complex, dimension(4,nzsr,nzob) GRHOO )

```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.45 main_prm_at_rcv()

```

subroutine main_prm_at_rcv (
    integer, intent(in) HIGH_FRQ,
    integer CS_TYPE,
    integer KACC,
    integer MLAYER,
    real, dimension(0:mlayer), intent(in) ZBND,
    real, dimension(mlayer), intent(in) RMU_LYR,
    complex, dimension(0:mlayer) CDH,
    real FRQ,
    integer, intent(in) NTXE,
    real, dimension(2,ntxe), intent(in) MD_ANGLE,
    integer, intent(in) NCRD,
    integer, intent(in) M_RX,
    integer, dimension(m_rx,ntxe), intent(in) N_SUB_RX,
    integer, dimension(m_rx,ntxe), intent(in) RX_TYPE_INDEX,
    integer, intent(in) SUB_RX_MAX,
    integer, intent(in) SOURCE_TYPE,
    integer, dimension(ntxe), intent(in) N_RX,
    real, dimension(sub_rx_max,m_rx,ntxe), intent(in) RX_X,
    real, dimension(sub_rx_max,m_rx,ntxe), intent(in) RX_Y,

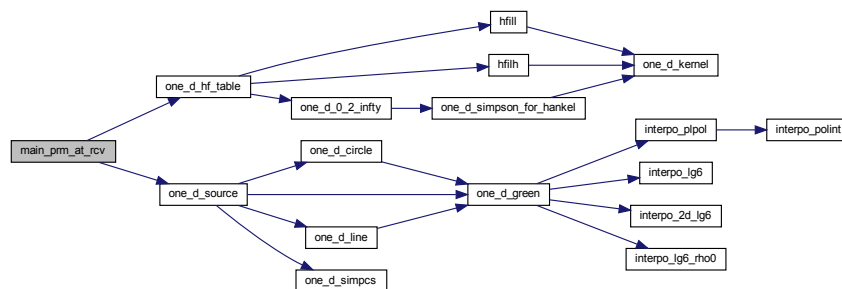
```

```

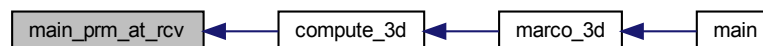
real, dimension(sub_rx_max,m_rx,ntxe), intent(in)  RX_Z,
real, dimension(3,sub_rx_max,m_rx,ntxe), intent(in) RX_WEIGHT,
integer, dimension(ntxe), intent(in)  N_VRTX,
real, dimension(ncrd,ntxe), intent(in) TX_CRDX,
real, dimension(ncrd,ntxe), intent(in) TX_CRDY,
real, dimension(ncrd,ntxe), intent(in) TX_CRDZ,
integer, intent(in) E_ONLY,
complex, dimension(m_rx,ntxe) ENX,
complex, dimension(m_rx,ntxe) ENY,
complex, dimension(m_rx,ntxe) ENZ,
complex, dimension(m_rx,ntxe) HNX,
complex, dimension(m_rx,ntxe) HNY,
complex, dimension(m_rx,ntxe) HNZ,
complex, dimension(m_rx,ntxe) VLT1D,
integer, intent(in) NHFILM,
real, dimension(mlayer), intent(in) LRYTH,
real, dimension(0:mlayer), intent(in) HVK,
complex, dimension(0:mlayer) KKH,
integer KANIS,
real BLMIN,
real DMIN,
real RHOMIN,
real RHOMAX,
integer, intent(in) NZOB,
real, dimension(nzob), intent(in) ZOBG,
integer, intent(in) NZSR,
real, dimension(2,nzsr), intent(in) ZSRG,
integer, intent(in) NZBG,
real, dimension(2,nzbg), intent(inout) ZBG,
real ALMAX,
complex, dimension(11,nhfilm,nzsr,nzob) GRHF,
real, dimension(nhfilm), intent(inout) RRG,
complex, dimension(4,nzsr,nzob) GRH00 )

```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.46 main_scatter_eh_cs()

```

subroutine main_scatter_eh_cs (
    integer, intent(in) SUB_RX_MAX,
    integer, dimension(m_rx,ntxe), intent(in) RX_TYPE_INDEX,
    integer HIGH_FRQ,
    integer KACC,
    integer KSYMM,
    integer MBODY,
    integer NBMAX,
    integer NSUBCM,
    integer NBODY,
    integer, dimension(mbody) SUB_BLOCK,
    integer, dimension(nbmax,mbody) NCELL,
    integer, dimension(mbody) NET,
    complex, dimension(nsubcm,nbmax,mbody) TCDB,
    complex, dimension(nmax) EMT,
    complex, dimension(nmax,mbody) JST,
    complex, dimension(4*nmax*mbody) EJGS,
    integer NMAX,
    integer NTXE,
    integer, dimension(ntxe) N_RX,
    integer, dimension(m_rx,ntxe) N_SUB_RX,
    real, dimension(3,sub_rx_max,m_rx,ntxe), intent(in) RX_WEIGHT,
    integer NHFILM,
    real FRQ,
    integer MLAYER,
    real, dimension(0:mlayer) ZBND,
    real, dimension(mlayer) LRYTH,
    real, dimension(0:mlayer) HVK,
    complex, dimension(0:mlayer) KKH,
    real, dimension(mlayer) RMU_LYR,
    integer KANIS,
    real BLMIN,
    real DMIN,
    real RHOMIN,
    real RHOMAX,
    integer NZOB,
    real, dimension(nzob) ZOBG,
    integer NZSR,
    real, dimension(2,nzsr) ZSRG,
    real ALMAX,
    real, dimension(nhfilm) RRG,
    real, dimension(nhfilm) RRG3,
    complex, dimension(11,nhfilm,nzsr,nzob) GRHF,
    complex, dimension(11,nhfilm,nzsr) GRHF3,
    complex, dimension(4,nzsr,nzob) GRH00,
    complex, dimension(4,nzsr) GRH003,
    real, dimension(sub_rx_max,m_rx,ntxe), intent(in) RX_X,
    real, dimension(sub_rx_max,m_rx,ntxe), intent(in) RX_Y,
    real, dimension(sub_rx_max,m_rx,ntxe), intent(in) RX_Z,
    integer NXMAX,
    integer NYMAX,
    integer NZMAX,
    integer NEQ,

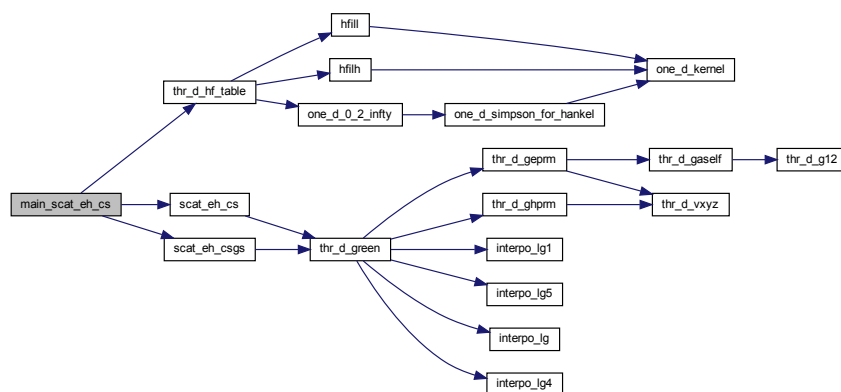
```

```

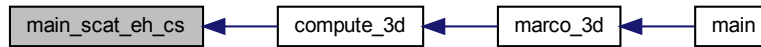
integer, dimension(nbmax,mbody) NX,
integer, dimension(nbmax,mbody) NY,
integer, dimension(nbmax,mbody) NZ,
real, dimension(nxmax,nbmax,mbody) XCELL,
real, dimension(nymax,nbmax,mbody) YCELL,
real, dimension(nzmax,nbmax,mbody) ZCELL,
real, dimension(nbmax,mbody) BLX,
real, dimension(nbmax,mbody) BLY,
real, dimension(nbmax,mbody) BLZ,
complex, dimension(0:mlayer) CDH,
complex, dimension(0:mlayer) CDV,
integer KSFT,
real, dimension(nbody) CLMN,
integer M_RX,
complex, dimension(m_rx,ntxe) ENX,
complex, dimension(m_rx,ntxe) ENY,
complex, dimension(m_rx,ntxe) ENZ,
complex, dimension(m_rx) EAX,
complex, dimension(m_rx) EAY,
complex, dimension(m_rx) EAZ,
complex, dimension(m_rx) HAX,
complex, dimension(m_rx) HAY,
complex, dimension(m_rx) HAZ,
complex, dimension(m_rx,ntxe), intent(out) VLT3D,
complex, dimension(m_rx,ntxe) ESX,
complex, dimension(m_rx,ntxe) ESY,
complex, dimension(m_rx,ntxe) ESZ,
complex, dimension(m_rx,ntxe) HSX,
complex, dimension(m_rx,ntxe) HSY,
complex, dimension(m_rx,ntxe) HSZ )

```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.47 main_scatter_eh_mt()

```

subroutine main_scatter_eh_mt (
    integer HIGH_FRQ,
    integer KACC,
    integer KSYMM,
    integer MBODY,
    integer NBMAX,
    integer NSUBCM,
    integer NBODY,
    integer, dimension(mbody) SUB_BLOCK,
    integer, dimension(nbmax,mbody) NCELL,
    complex, dimension(nsubcm,nbmax,mbody) TCDB,
    complex, dimension(nmax,mbody) JST,
    integer NMAX,
    integer NHFILM,
    real FRQ,
    integer MLAYER,
    real, dimension(0:mlayer) ZBND,
    real, dimension(mlayer) LRYTH,
    real, dimension(0:mlayer) HVK,
    complex, dimension(0:mlayer) KKH,
    integer KANIS,
    real BLMIN,
    real DMIN,
    real RHOMIN,
    real RHOMAX,
    integer NZOB,
    real, dimension(nzob) ZOBG,
    integer NZSR,
    real, dimension(2,nzsr) ZSRG,
    real ALMAX,
    real, dimension(nhfilm) RRG,
    real, dimension(nhfilm) RRG3,
    complex, dimension(11,nhfilm,nzsr,nzob) GRHF,
    complex, dimension(11,nhfilm,nzsr) GRHF3,
    complex, dimension(4,nzsr,nzob) GRH00,
    complex, dimension(4,nzsr) GRH003,
    integer MT_PROFL,
    integer MT_STATN,
    real, dimension(mt_profl) XRMT,
    real, dimension(mt_statn) YRMT,
    integer NXMAX,

```

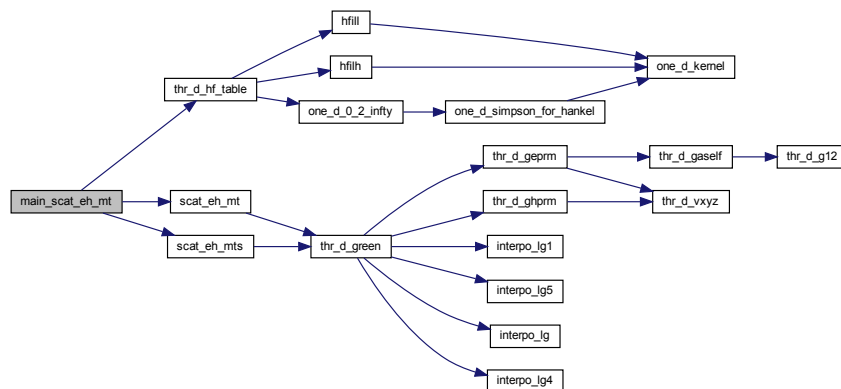


```

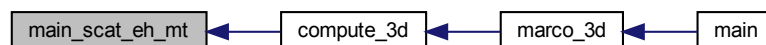
integer NYMAX,
integer NZMAX,
integer, dimension(nbmax,mbody) NX,
integer, dimension(nbmax,mbody) NY,
integer, dimension(nbmax,mbody) NZ,
real, dimension(nxmax,nbmax,mbody) XCELL,
real, dimension(nymax,nbmax,mbody) YCELL,
real, dimension(nzmax,nbmax,mbody) ZCELL,
real, dimension(nbmax,mbody) BLX,
real, dimension(nbmax,mbody) BLY,
real, dimension(nbmax,mbody) BLZ,
complex, dimension(0:mlayer) CDH,
integer NPOL,
complex EOX1,
complex EOY1,
real ZMT,
integer KSFT,
real, dimension(nbody) CLMN,
complex, dimension(mt_profl,mt_statn,2) EXMT,
complex, dimension(mt_profl,mt_statn,2) EYMT,
complex, dimension(mt_profl,mt_statn,2) HXMT,
complex, dimension(mt_profl,mt_statn,2) HYMT,
complex, dimension(mt_profl,mt_statn,2) HZMT )

```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.48 `main_solver()`

```

subroutine main_solver (
    integer NW,
    complex, dimension(nmax,nmax) GA,
    integer, dimension(nmax) IND,
    complex, dimension(nmax) EMT,
    complex, dimension(nmax) EN,
    complex, dimension(nmax,mbody) ENT,
    integer, dimension(mbody) NET,
    complex, dimension(nmax,mbody) JST,
    complex, dimension(4*nmax*mbody) EJGS,
    complex, dimension(4*nmax*mbody) EJGS2,
    integer KACC,
    integer KSMR,
    integer KSYMM,
    integer CS_TYPE,
    integer KANIS,
    integer KBOUND,
    integer NTXE,
    integer LP1,
    integer LP2,
    integer NPOL,
    integer MBODY,
    integer NBMAX,
    integer NXMAX,
    integer NYMAX,
    integer NZMAX,
    integer NMAX,
    integer NBODY,
    integer, dimension(mbody) SUB_BLOCK,
    integer, dimension(nbmax,mbody) NX,
    integer, dimension(nbmax,mbody) NY,
    integer, dimension(nbmax,mbody) NZ,
    integer, dimension(nbmax,mbody) NCELL,
    integer, dimension(mbody) NCT,
    integer, dimension(mbody) KCELL,
    real, dimension(nxmax,nbmax,mbody) XCELL,
    real, dimension(nymax,nbmax,mbody) YCELL,
    real, dimension(nzmax,nbmax,mbody) ZCELL,
    real, dimension(nbmax,mbody) BLX,
    real, dimension(nbmax,mbody) BLY,
    real, dimension(nbmax,mbody) BLZ,
    integer, dimension(nbmax) NXI,
    integer, dimension(nbmax) NYI,
    integer, dimension(nbmax) NZI,
    integer, dimension(nbmax) NCELLI,
    real, dimension(nxmax,nbmax) XCELLI,
    real, dimension(nymax,nbmax) YCELLI,
    real, dimension(nzmax,nbmax) ZCELLI,
    real, dimension(nbmax) BLXI,
    real, dimension(nbmax) BLYI,
    real, dimension(nbmax) BLZI,
    integer, dimension(nbmax) NXJ,
    integer, dimension(nbmax) NYJ,
    integer, dimension(nbmax) NZJ,
    integer, dimension(nbmax) NCELLJ,
    real, dimension(nxmax,nbmax) XCELLJ,

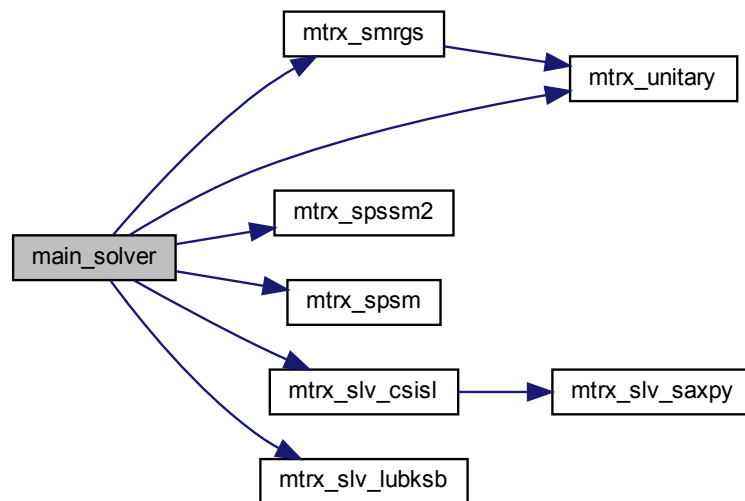
```

```

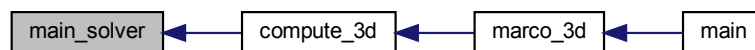
real, dimension(nymax,nbmax) YCELLJ,
real, dimension(nzmax,nbmax) ZCELLJ,
real SBX,
real SBY,
real SBZ,
integer NXS,
integer NYS,
integer NZS,
real ZSB,
integer NSMR,
complex, dimension(nsmr/3,3) GSB2,
integer NEQ )

```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.49 main_super_grid()

```

subroutine main_super_grid (
    complex, dimension(nsmr/3,3) GSB1,

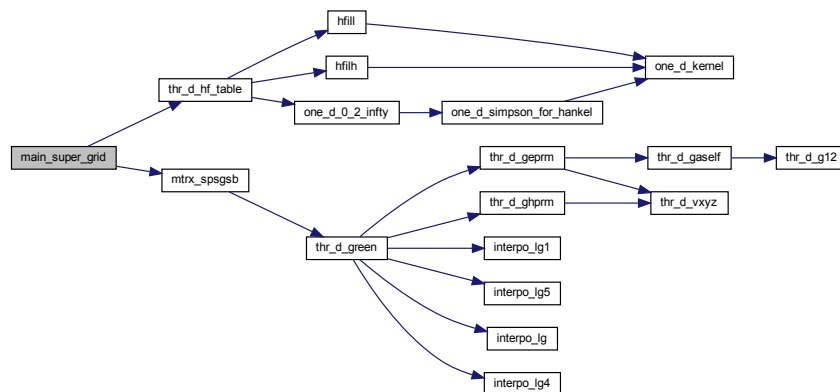
```

```

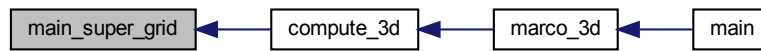
integer HIGH_FRQ,
real CLMN2,
integer KANIS,
real SBX,
real SBY,
real SBZ,
integer NXS,
integer NYS,
integer NZS,
real XSB,
real YSB,
real ZSB,
integer NSMR,
real FRQ,
integer MLAYER,
real, dimension(0:mlayer) ZBND,
real, dimension(mlayer) LRYTH,
complex, dimension(0:mlayer) KKH,
complex, dimension(0:mlayer) CDH,
real, dimension(0:mlayer) HVK,
integer NZOB,
real, dimension(nzob) ZOBG,
integer NZSR,
real, dimension(2,nzsr) ZSRG,
real DMIN,
integer NHFILM,
real RHOMIN,
real RHOMAX,
real, dimension(nhfilm) RRG,
real, dimension(nhfilm) RRG3,
complex, dimension(11,nhfilm,nzsr,nzob) GRHF,
complex, dimension(11,nhfilm,nzsr) GRHF3,
complex, dimension(4,nzsr,nzob) GRH00,
complex, dimension(4,nzsr) GRH003,
real ALMAX,
integer KSFT,
integer KCLMN,
real BLMIN,
integer KACC,
integer KUTCRCP )

```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.50 marco_3d()

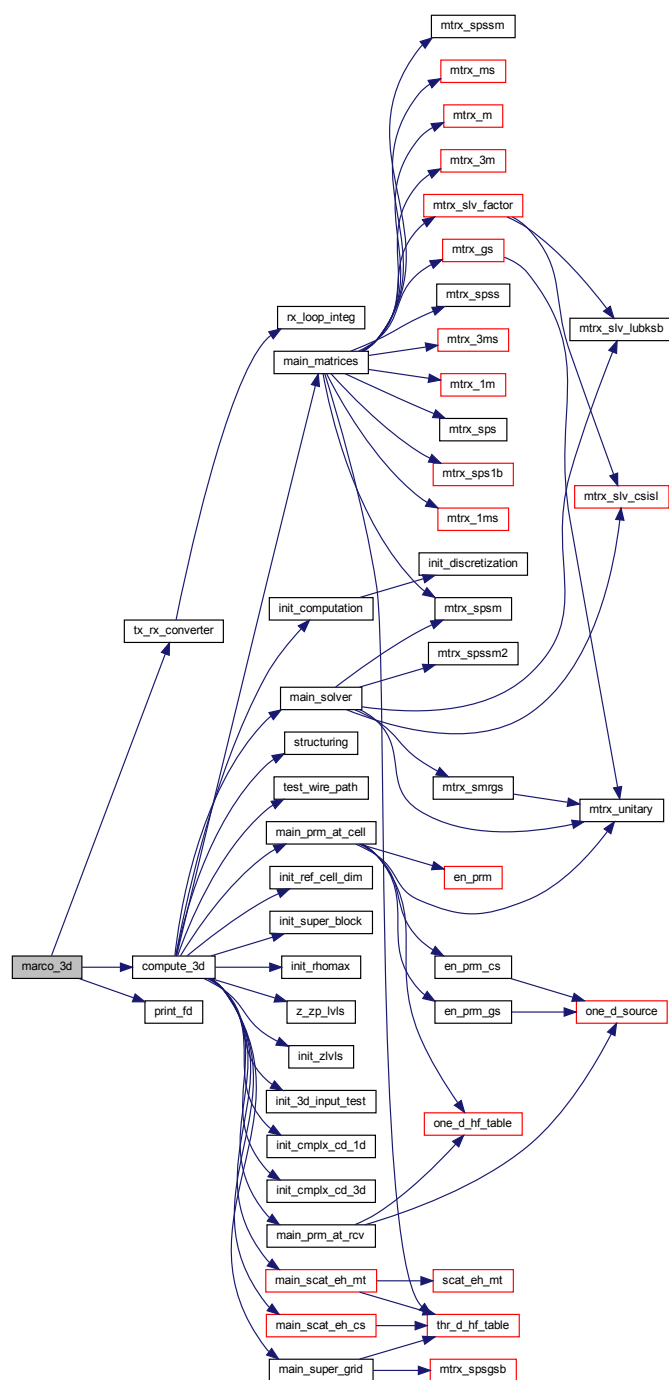
```

subroutine marco_3d (
    integer NW,
    integer DO3D,
    integer NFRQ,
    real, dimension(nfrq) FREQ,
    integer SURVEY_TYPE,
    integer SOURCE_TYPE,
    integer NTXE,
    integer MXVRTX,
    integer, dimension (ntxe) N_VRTX,
    real, dimension (mxvrtx,ntxe) SXE,
    real, dimension (mxvrtx,ntxe) SXN,
    real, dimension (mxvrtx,ntxe) SXZ,
    real, dimension(ntxe) SXDIP,
    real, dimension(ntxe) SXAZ,
    integer NRXG,
    integer, dimension (ntxe) NRGTX,
    integer, dimension (nrxg) RX_TYPE,
    integer, dimension(nrxg,ntxe) RGTXID,
    integer, dimension (ntxe) NRXTX,
    integer, dimension (nrxg) NRX,
    integer MRX,
    integer LRX,
    integer MQVR,
    real, dimension (mrx,nrxg,mqvr) RXE,
    real, dimension (mrx,nrxg,mqvr) RXN,
    real, dimension (mrx,nrxg,mqvr) RXZ,
    integer NLYR,
    real, dimension(nlyr) THK,
    real, dimension(nlyr) RES,
    real, dimension(nlyr) RMU,
    real, dimension(nlyr) REPS,
    real, dimension(nlyr) CHRG,
    real, dimension(nlyr) CTAU,
    real, dimension(nlyr) CFREQ,
    integer KSYMM,
    integer NPRISM,
    real, dimension(nprism) PRISM_ZMID,
    real, dimension(nprism) PRISM_EAST,
    real, dimension(nprism) PRISM_NORTH,
    real, dimension(nprism) PRSM_SIZE_EW,

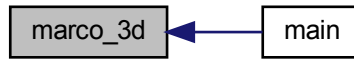
```

```
real, dimension(nprism) PRSM_SIZE_NS,  
real, dimension(nprism) PRSM_SIZE_Z,  
integer, dimension(nprism) NCELL_EW,  
integer, dimension(nprism) NCELL_NS,  
integer, dimension(nprism) NCELL_Z,  
real, dimension(nprism) PRSM_RES,  
real, dimension(nprism) RMUP,  
real, dimension(nprism) REPSP,  
real, dimension(nprism) PRSM_CHRG,  
real, dimension(nprism) PRSM_TAU,  
real, dimension(nprism) PRSM_CFR,  
integer KACC,  
integer SOLVER,  
complex, dimension(nfrq,lrx,ntxe,3) BFD,  
complex, dimension(nfrq,lrx,ntxe,3) BFD_SCAT )
```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.51 md_prm()

```

subroutine md_prm (
    integer NW,
    real SXDP1,
    real SXAZ1,
    real RXON,
    real RXOE,
    real RXOZ,
    integer CMPDX,
    real, dimension(3,2) DXPRM )
  
```

Here is the caller graph for this function:



4.1.1.52 mtrx_lm()

```

subroutine mtrx_lm (
    integer NMAX,
    integer N,
    integer NXMAX,
    integer NYMAX,
    integer NZMAX,
    integer, dimension(sub_block) NX,
    integer, dimension(sub_block) NY,
    integer, dimension(sub_block) NZ,
    integer, dimension(sub_block) NCELL,
  
```

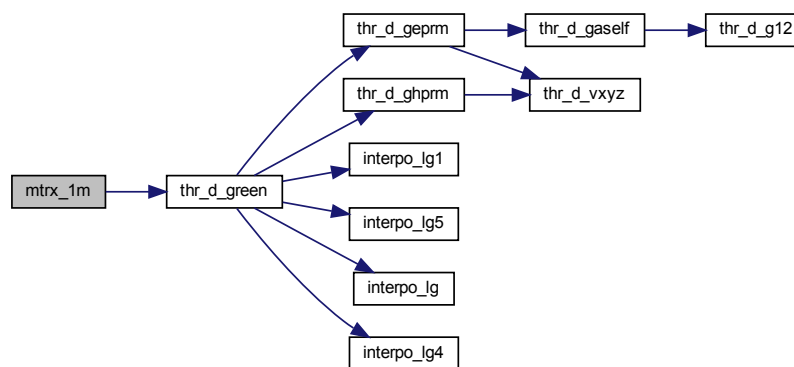


```

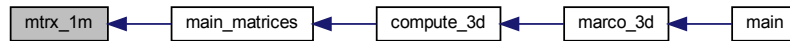
integer NSUBCM,
integer SUB_BLOCK,
real, dimension(nxmax,sub_block) X,
real, dimension(nymax,sub_block) Y,
real, dimension(nzmax,sub_block) Z,
real, dimension(sub_block) CLX,
real, dimension(sub_block) CLY,
real, dimension(sub_block) CLZ,
complex, dimension(nsubcm,sub_block) CDB,
complex, dimension(nmax,n) G,
real FRQ,
integer MLAYER,
real, dimension(0:mayer) ZBND,
complex, dimension(0:mayer) CDH,
complex, dimension(0:mayer) CDV,
real, dimension(0:mayer) HVK,
integer NZOB,
real, dimension(nzob) ZOBG,
integer NZSR,
real, dimension(2,nzsr) ZSRG,
real RHOMIN,
real DMIN,
integer NHFILM,
real, dimension(nrg) RRG,
integer NRG,
complex, dimension(11,nhfilm,nzsr,nzob) GRHF,
real, dimension(nrg3) RRG3,
integer NRG3,
complex, dimension(11,nhfilm,nzsr) GRHF3,
complex, dimension(4,nzsr,nzob) GRHO0,
complex, dimension(4,nzsr) GRHO03,
real CLMN,
integer KCLMN,
real BLMIN,
integer KACC,
integer KUTCRCP )

```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.53 mtrx_1ms()

```

subroutine mtrx_1ms (
    integer NMAX,
    integer N,
    integer NXMAX,
    integer NYMAX,
    integer NZMAX,
    integer, dimension(sub_block) NX,
    integer, dimension(sub_block) NY,
    integer, dimension(sub_block) NZ,
    integer, dimension(sub_block) NCELL,
    integer NSUBCM,
    integer SUB_BLOCK,
    real, dimension(nxmax,sub_block) X,
    real, dimension(nymax,sub_block) Y,
    real, dimension(nzmax,sub_block) Z,
    real, dimension(sub_block) CLX,
    real, dimension(sub_block) CLY,
    real, dimension(sub_block) CLZ,
    complex, dimension(nsubcm,sub_block) CDB,
    complex, dimension(nmax,n) G,
    real FRQ,
    integer MLAYER,
    real, dimension(0:mlayer) ZBND,
    complex, dimension(0:mlayer) CDH,
    complex, dimension(0:mlayer) CDV,
    real, dimension(0:mlayer) HVK,
    integer NZOB,
    real, dimension(nzob) ZOBG,
    integer NZSR,
    real, dimension(2,nzsr) ZSRG,
    real RHOMIN,
    real DMIN,
    integer NHFILM,
    real, dimension(nrg) RRG,
    integer NRG,
    complex, dimension(11,nhfilm,nzsr,nzob) GRHF,
    real, dimension(nrg3) RRG3,
    integer NRG3,
    complex, dimension(11,nhfilm,nzsr) GRHF3,
    complex, dimension(4,nzsr,nzob) GRH00,
    complex, dimension(4,nzsr) GRH003,
    real CLMN,

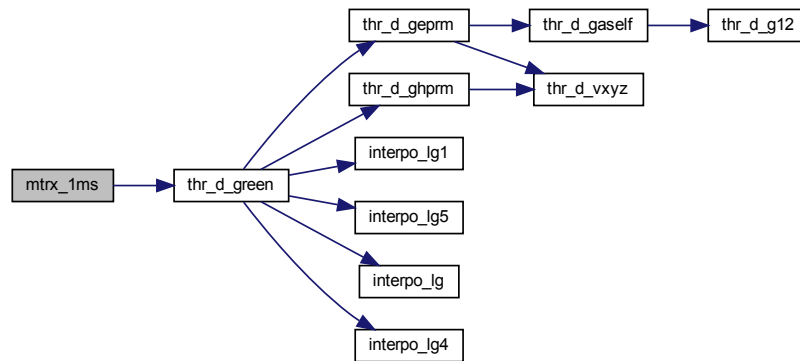
```

```

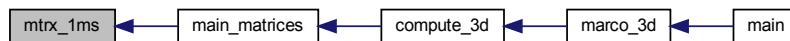
integer KCLMN,
real BLMIN,
integer KACC,
integer KUTC RP )

```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.54 mtrx_3m()

```

subroutine mtrx_3m (
    integer NMAX,
    integer N,
    integer NXMAX,
    integer NYMAX,
    integer NZMAX,
    integer, dimension(sub_block) NX,
    integer, dimension(sub_block) NY,
    integer, dimension(sub_block) NZ,
    integer, dimension(sub_block) NCELL,
    integer NSUBCM,
    integer SUB_BLOCK,
    real, dimension(nxmax,sub_block) X,
    real, dimension(nymax,sub_block) Y,
    real, dimension(nzmax,sub_block) Z,
    real, dimension(sub_block) CLX,
    real, dimension(sub_block) CLY,

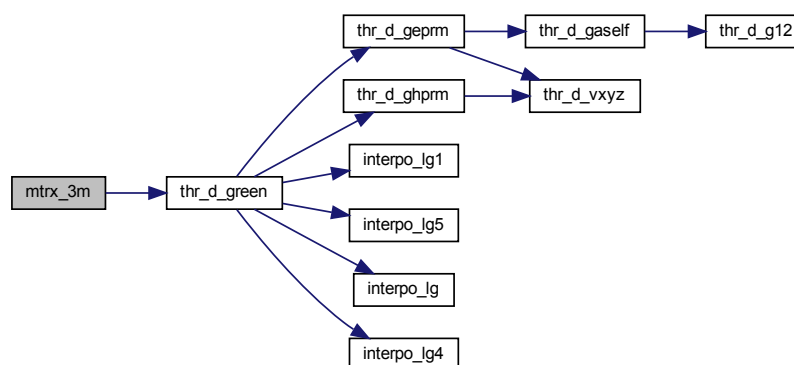
```

```

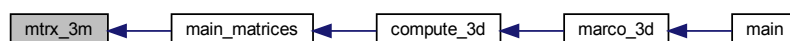
real, dimension(sub_block) CLZ,
complex, dimension(nsubcm,sub_block) CDB,
integer KSYM,
complex, dimension(nmax,n) G,
real FRQ,
integer MLAYER,
real, dimension(0:mlayer) ZBND,
complex, dimension(0:mlayer) CDH,
complex, dimension(0:mlayer) CDV,
real, dimension(0:mlayer) HVK,
integer NZOB,
real, dimension(nzob) ZOBG,
integer NZSR,
real, dimension(2,nzsr) ZSRG,
real RHOMIN,
real DMIN,
integer NHFILM,
real, dimension(nrg) RRG,
integer NRG,
complex, dimension(11,nhfilm,nzsr,nzob) GRHF,
real, dimension(nrg3) RRG3,
integer NRG3,
complex, dimension(11,nhfilm,nzsr) GRHF3,
complex, dimension(4,nzsr,nzob) GRHO0,
complex, dimension(4,nzsr) GRHO03,
real CLMN,
integer KCLMN,
real BLMIN,
integer KACC,
integer KUTCRP )

```

Here is the call graph for this function:



Here is the caller graph for this function:



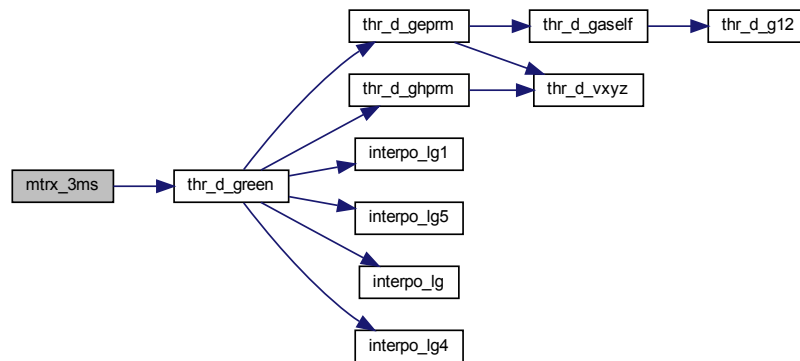
4.1.1.55 mtrx_3ms()

```

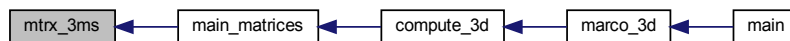
subroutine mtrx_3ms (
    integer NMAX,
    integer N,
    integer NXMAX,
    integer NYMAX,
    integer NZMAX,
    integer, dimension(sub_block) NX,
    integer, dimension(sub_block) NY,
    integer, dimension(sub_block) NZ,
    integer, dimension(sub_block) NCELL,
    integer NSUBCM,
    integer SUB_BLOCK,
    real, dimension(nxmax,sub_block) X,
    real, dimension(nymax,sub_block) Y,
    real, dimension(nzmax,sub_block) Z,
    real, dimension(sub_block) CLX,
    real, dimension(sub_block) CLY,
    real, dimension(sub_block) CLZ,
    complex, dimension(nsubcm,sub_block) CDB,
    integer KSYM,
    complex, dimension(nmax,n) G,
    real FRQ,
    integer MLAYER,
    real, dimension(0:mlayer) ZBND,
    complex, dimension(0:mlayer) CDH,
    complex, dimension(0:mlayer) CDV,
    real, dimension(0:mlayer) HVK,
    integer NZOB,
    real, dimension(nzob) ZOBG,
    integer NZSR,
    real, dimension(2,nzsr) ZSRG,
    real RHOMIN,
    real DMIN,
    integer NHFILM,
    real, dimension(nrg) RRG,
    integer NRG,
    complex, dimension(11,nhfilm,nzsr,nzob) GRHF,
    real, dimension(nrg3) RRG3,
    integer NRG3,
    complex, dimension(11,nhfilm,nzsr) GRHF3,
    complex, dimension(4,nzsr,nzob) GRH00,
    complex, dimension(4,nzsr) GRH003,
    real CLMN,
    integer KCLMN,
    real BLMIN,
    integer KACC,
    integer KUTCPR )

```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.56 mtrx_gs()

```

subroutine mtrx_gs (
    integer KSMR,
    integer NSMR,
    integer NXS,
    integer NYS,
    integer NZS,
    real SBX,
    real SBY,
    real SBZ,
    real ZSB,
    integer KS,
    integer KDIAG,
    integer N,
    integer N2,
    real CLX,
    real CLY,
    real CLZ,
    real XSR,
    real YSR,
    real ZSR,
    integer NMAX,
    integer NXMAX,

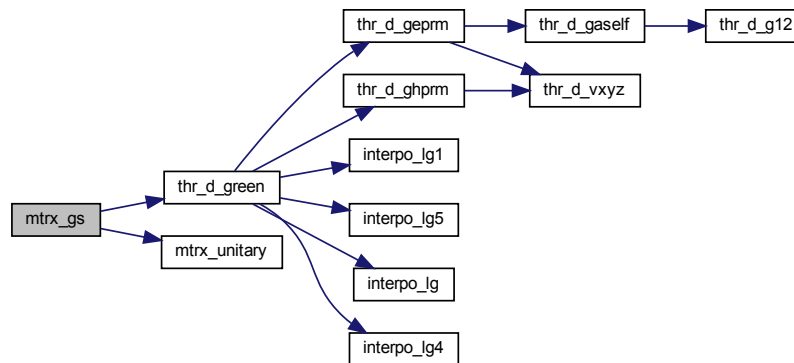
```

```

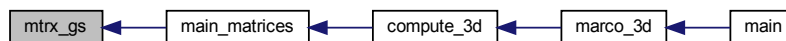
integer NYMAX,
integer NZMAX,
integer, dimension(sub_block) NX,
integer, dimension(sub_block) NY,
integer, dimension(sub_block) NZ,
integer, dimension(sub_block) NCELL,
integer NSUBCM,
integer SUB_BLOCK,
real, dimension(nxmax,sub_block) X,
real, dimension(nymax,sub_block) Y,
real, dimension(nzmax,sub_block) Z,
complex, dimension(nsubcm,sub_block) CDB,
complex, dimension(nmax,n) G,
complex, dimension(nsmr/3,3) GSB2,
real FRQ,
integer MLAYER,
real, dimension(0:mayer) ZBND,
complex, dimension(0:mayer) CDH,
complex, dimension(0:mayer) CDV,
real, dimension(0:mayer) HVK,
integer NZOB,
real, dimension(nzob) ZOBG,
integer NZSR,
real, dimension(2,nzsr) ZSRG,
real RHOMIN,
real DMIN,
integer NHFILM,
real, dimension(nrg) RRG,
integer NRG,
complex, dimension(11,nhfilm,nzsr,nzob) GRHF,
real, dimension(nrg3) RRG3,
integer NRG3,
complex, dimension(11,nhfilm,nzsr) GRHF3,
complex, dimension(4,nzsr,nzob) GRH00,
complex, dimension(4,nzsr) GRH003,
real CLMN,
integer KCLMN,
real BLMIN,
integer KACC,
integer KUTCPR )

```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.57 mtrx_m()

```

subroutine mtrx_m (
    integer NMAX,
    integer N,
    integer NXMAX,
    integer NYMAX,
    integer NZMAX,
    integer, dimension(sub_block1) NX1,
    integer, dimension(sub_block1) NY1,
    integer, dimension(sub_block1) NZ1,
    integer, dimension(sub_block1) NCELL1,
    integer SUB_BLOCK1,
    real, dimension(nxmax,sub_block1) X1,
    real, dimension(nymax,sub_block1) Y1,
    real, dimension(nzmax,sub_block1) Z1,
    integer, dimension(sub_block2) NX2,
    integer, dimension(sub_block2) NY2,
    integer, dimension(sub_block2) NZ2,
    integer, dimension(sub_block2) NCELL2,
    integer SUB_BLOCK2,
    real, dimension(nxmax,sub_block2) X2,
    real, dimension(nymax,sub_block2) Y2,

```

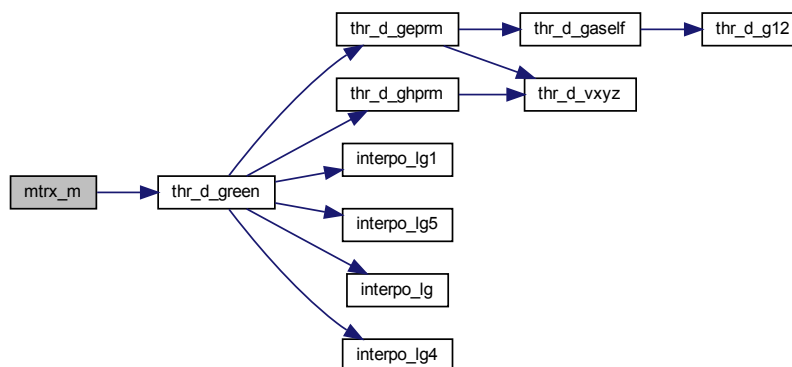


```

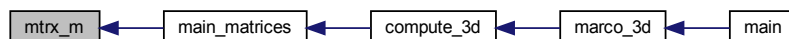
real, dimension(nzmax,sub_block2) Z2,
real, dimension(sub_block2) CLX2,
real, dimension(sub_block2) CLY2,
real, dimension(sub_block2) CLZ2,
complex, dimension(nmax,n) G,
real FRQ,
integer MLAYER,
real, dimension(0:mlayer) ZBND,
complex, dimension(0:mlayer) CDH,
real, dimension(0:mlayer) HVK,
integer NZOB,
real, dimension(nzob) ZOBG,
integer NZSR,
real, dimension(2,nzsr) ZSRG,
real RHOMIN,
real DMIN,
integer NHFILM,
real, dimension(nrg) RRG,
integer NRG,
complex, dimension(11,nhfilm,nzsr,nzob) GRHF,
real, dimension(nrg3) RRG3,
integer NRG3,
complex, dimension(11,nhfilm,nzsr) GRHF3,
complex, dimension(4,nzsr,nzob) GRH00,
complex, dimension(4,nzsr) GRH003,
real CLMN,
integer KCLMN,
real BLMIN,
integer KACC,
integer KUTCPR )

```

Here is the call graph for this function:



Here is the caller graph for this function:



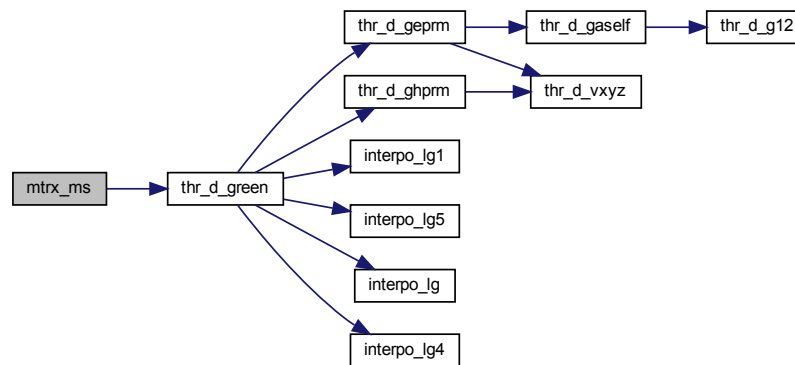
4.1.1.58 mtrx_ms()

```

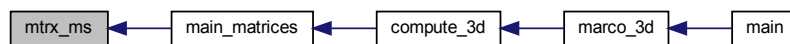
subroutine mtrx_ms (
    integer NMAX,
    integer N,
    integer NXMAX,
    integer NYMAX,
    integer NZMAX,
    integer, dimension(sub_block1) NX1,
    integer, dimension(sub_block1) NY1,
    integer, dimension(sub_block1) NZ1,
    integer, dimension(sub_block1) NCELL1,
    integer SUB_BLOCK1,
    real, dimension(nxmax,sub_block1) X1,
    real, dimension(nymax,sub_block1) Y1,
    real, dimension(nzmax,sub_block1) Z1,
    integer, dimension(sub_block2) NX2,
    integer, dimension(sub_block2) NY2,
    integer, dimension(sub_block2) NZ2,
    integer, dimension(sub_block2) NCELL2,
    integer SUB_BLOCK2,
    real, dimension(nxmax,sub_block2) X2,
    real, dimension(nymax,sub_block2) Y2,
    real, dimension(nzmax,sub_block2) Z2,
    real, dimension(sub_block2) CLX2,
    real, dimension(sub_block2) CLY2,
    real, dimension(sub_block2) CLZ2,
    integer KSYM,
    complex, dimension(nmax,n) G,
    real FRQ,
    integer MLAYER,
    real, dimension(0:mlayer) ZBND,
    complex, dimension(0:mlayer) CDH,
    real, dimension(0:mlayer) HVK,
    integer NZOB,
    real, dimension(nzob) ZOBG,
    integer NZSR,
    real, dimension(2,nzsr) ZSRG,
    real RHOMIN,
    real DMIN,
    integer NHFILM,
    real, dimension(nrg) RRG,
    integer NRG,
    complex, dimension(11,nhfilm,nzsr,nzob) GRHF,
    real, dimension(nrg3) RRG3,
    integer NRG3,
    complex, dimension(11,nhfilm,nzsr) GRHF3,
    complex, dimension(4,nzsr,nzob) GRH00,
    complex, dimension(4,nzsr) GRH003,
    real CLMN,
    integer KCLMN,
    real BLMIN,
    integer KACC,
    integer KUTCRP )

```

Here is the call graph for this function:



Here is the caller graph for this function:



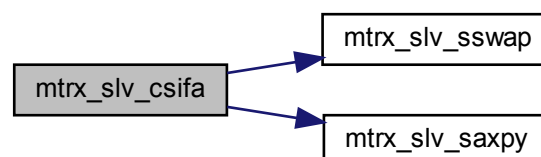
4.1.1.59 mtrx_slv_csifa()

```

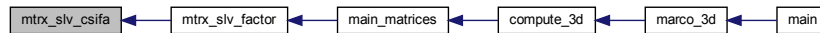
subroutine mtrx_slv_csifa (
    complex, dimension(lda,n) A,
    integer LDA,
    integer N,
    integer, dimension(n) KPVT,
    integer INFO )

```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.60 mtrx_slv_csisl()

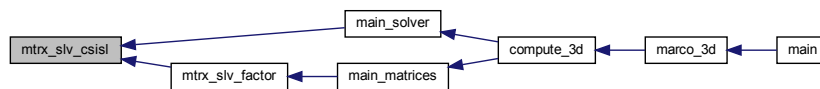
```

subroutine mtrx_slv_csisl (
    complex, dimension(lda,n) A,
    integer LDA,
    integer N,
    integer, dimension(n) KPVT,
    complex, dimension(n) B )
  
```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.61 mtrx_slv_factor()

```

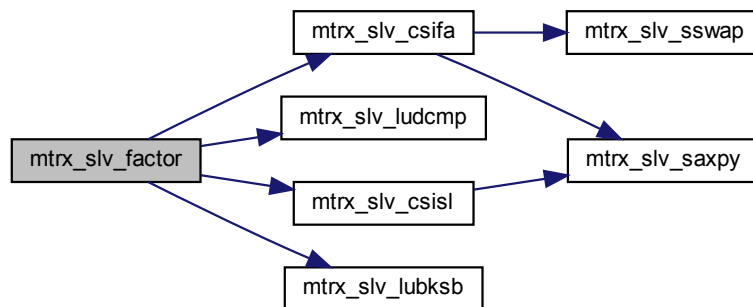
subroutine mtrx_slv_factor (
    integer NW,
    complex, dimension(nmax,n) A,
    integer NMAX,
    integer N,
    integer, dimension(n) IND,
  
```

```

real, dimension(n) V,
complex, dimension(n) C1,
real, dimension(n) AI,
integer KSYM,
integer KCOND,
real ANORM1,
real ANORM3,
real COND1,
real COND3,
real AEM )

```

Here is the call graph for this function:



Here is the caller graph for this function:



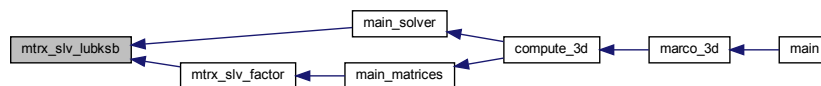
4.1.1.62 mtrx_slv_lubksb()

```

subroutine mtrx_slv_lubksb (
    complex, dimension(np,np) A,
    complex, dimension(n) B,
    integer NP,
    integer N,
    integer, dimension(n) INDEX )

```

Here is the caller graph for this function:



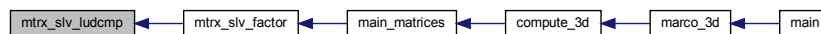
4.1.1.63 mtrx_slv_ludcmp()

```

subroutine mtrx_slv_ludcmp (
    integer NW,
    complex, dimension(np,np) A,
    integer NP,
    integer N,
    integer, dimension(n) INDEX,
    real, dimension(n) VV,
    real D )

```

Here is the caller graph for this function:



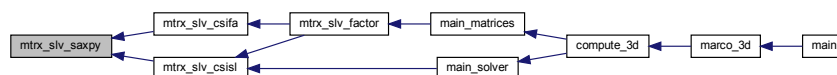
4.1.1.64 mtrx_slv_saxpy()

```

subroutine mtrx_slv_saxpy (
    integer N,
    complex SA,
    complex, dimension(n) SX,
    integer INCX,
    complex, dimension(n) SY,
    integer INCY )

```

Here is the caller graph for this function:



4.1.1.65 mtrx_slv_sswap()

```

subroutine mtrx_slv_sswap (
    integer N,
    complex, dimension(n) SX,
    integer INCX,
    complex, dimension(n) SY,
    integer INCY )

```

Here is the caller graph for this function:



4.1.1.66 mtrx_smrgs()

```

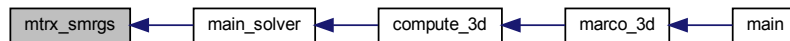
subroutine mtrx_smrgs (
    integer NXS,
    integer NYS,
    integer NZS,
    real SBX,
    real SBY,
    real SBZ,
    real ZSB,
    integer NMAX,
    integer NXMAX,
    integer NYMAX,
    integer NZMAX,
    integer NETI,
    integer SUB_BLOCKI,
    integer, dimension(sub_blocki) NCELLI,
    real, dimension(nxmax,sub_blocki) XCELLI,
    real, dimension(nymax,sub_blocki) YCELLI,
    real, dimension(nzmax,sub_blocki) ZCELLI,
    integer, dimension(sub_blocki) NXI,
    integer, dimension(sub_blocki) NYI,
    integer, dimension(sub_blocki) NZI,
    integer NET,
    integer SUB_BLOCK,
    integer, dimension(sub_block) NCELL,
    integer, dimension(sub_block) NX,
    integer, dimension(sub_block) NY,
    integer, dimension(sub_block) NZ,
    real, dimension(nxmax,sub_block) X,
    real, dimension(nymax,sub_block) Y,
    real, dimension(nzmax,sub_block) Z,
    integer LQ,
    complex, dimension(nmax,neti) G,
    integer NSMR,
    complex, dimension(nsmr/3,3) GSB2 )

```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.67 mtrx_sps()

```

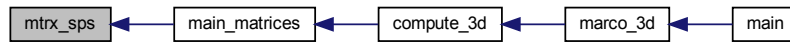
subroutine mtrx_sps (
    integer NSMR,
    integer MLAYER,
    real, dimension(0:mlayer) ZBND,
    complex, dimension(0:mlayer) CDH,
    complex, dimension(0:mlayer) CDV,
    real SBX,
    real SBY,
    real SBZ,
    integer NXS,
    integer NYS,
    integer NZS,
    real ZSB,
    integer NMAX,
    integer N,
    integer NXMAX,
    integer NYMAX,
    integer NZMAX,
    integer, dimension(sub_block) NX,
    integer, dimension(sub_block) NY,
    integer, dimension(sub_block) NZ,
    integer, dimension(sub_block) NCELL,
    integer NSUBCM,
    integer SUB_BLOCK,
    real, dimension(nxmax,sub_block) X,
    real, dimension(nymax,sub_block) Y,
    real, dimension(nzmax,sub_block) Z,
    complex, dimension(nsubcm,sub_block) CDB,

```



```
complex, dimension(nsmr/3,3) GSB2,
complex, dimension(nmax,n) G )
```

Here is the caller graph for this function:



4.1.1.68 mtrx_sps1b()

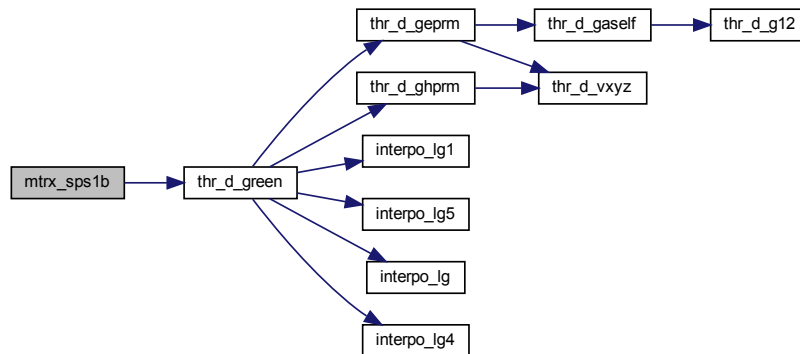
```
subroutine mtrx_sps1b (
    integer NMAX,
    integer N,
    integer NXMAX,
    integer NYMAX,
    integer NZMAX,
    integer, dimension(sub_block) NX,
    integer, dimension(sub_block) NY,
    integer, dimension(sub_block) NZ,
    integer NSUBCM,
    integer SUB_BLOCK,
    real, dimension(nxmax,sub_block) X,
    real, dimension(nymax,sub_block) Y,
    real, dimension(nzmax,sub_block) Z,
    real, dimension(sub_block) CLX,
    real, dimension(sub_block) CLY,
    real, dimension(sub_block) CLZ,
    complex, dimension(nsubcm,sub_block) CDB,
    complex, dimension(nmax,n) G,
    real FRQ,
    integer MLAYER,
    real, dimension(0:mlayer) ZBND,
    complex, dimension(0:mlayer) CDH,
    complex, dimension(0:mlayer) CDV,
    real, dimension(0:mlayer) HVK,
    integer NZOB,
    real, dimension(nzob) ZOBG,
    integer NZSR,
    real, dimension(2,nzsr) ZSRG,
    real RHOMIN,
    real DMIN,
    integer NHFILM,
    real, dimension(nrg) RRG,
    integer NRG,
    complex, dimension(11,nhfilm,nzsr,nzob) GRHF,
    real, dimension(nrg3) RRG3,
    integer NRG3,
    complex, dimension(11,nhfilm,nzsr) GRHF3,
    complex, dimension(4,nzsr,nzob) GRH00,
```

```

complex, dimension(4,nzsr) GRH003,
real CLMN,
integer KCLMN,
real BLMIN,
integer KACC,
integer KUTCPR )

```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.69 mtrx_spsgsb()

```

subroutine mtrx_spsgsb (
    real SBX,
    real SBY,
    real SBZ,
    integer NXS,
    integer NYS,
    integer NZS,
    real XSB,
    real YSB,
    real ZSB,
    integer NSMR,
    complex, dimension(nsmr/3,3) G,
    real FRQ,
    integer MLAYER,
    real, dimension(0:mlayer) ZBND,

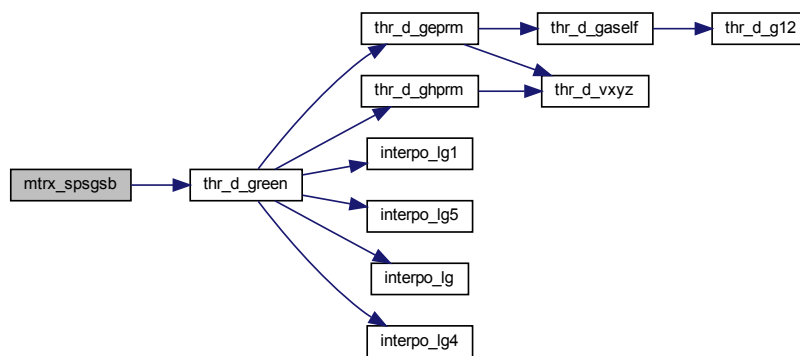
```

```

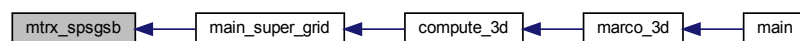
complex, dimension(0:mlayer) CDH,
real, dimension(0:mlayer) HVK,
integer NZOB,
real, dimension(nzob) ZOBG,
integer NZSR,
real, dimension(2,nzsr) ZSRG,
real RHOMIN,
real DMIN,
integer NHFILM,
real, dimension(nhfilm) RRG,
integer NRG,
complex, dimension(11,nhfilm,nzsr,nzob) GRHF,
real, dimension(nrg3) RRG3,
integer NRG3,
complex, dimension(11,nhfilm,nzsr) GRHF3,
complex, dimension(4,nzsr,nzob) GRH00,
complex, dimension(4,nzsr) GRH003,
real CLMN,
integer KCLMN,
real BLMIN,
integer KACC,
integer KUTCPR )

```

Here is the call graph for this function:



Here is the caller graph for this function:



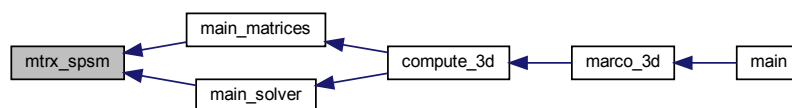
4.1.1.70 `mtrx_spsm()`

```

subroutine mtrx_spsm (
    real SBX,
    real SBY,
    real SBZ,
    integer NXS,
    integer NYS,
    integer NZS,
    real ZSB,
    integer NMAX,
    integer N,
    integer NXMAX,
    integer NYMAX,
    integer NZMAX,
    integer, dimension(sub_block1) NX1,
    integer, dimension(sub_block1) NY1,
    integer, dimension(sub_block1) NZ1,
    integer, dimension(sub_block1) NCELL1,
    integer SUB_BLOCK1,
    real, dimension(nxmax,sub_block1) X1,
    real, dimension(nymax,sub_block1) Y1,
    real, dimension(nzmax,sub_block1) Z1,
    integer, dimension(sub_block2) NX2,
    integer, dimension(sub_block2) NY2,
    integer, dimension(sub_block2) NZ2,
    integer, dimension(sub_block2) NCELL2,
    integer SUB_BLOCK2,
    real, dimension(nxmax,sub_block2) X2,
    real, dimension(nymax,sub_block2) Y2,
    real, dimension(nzmax,sub_block2) Z2,
    complex, dimension(nmax,n) G,
    integer NSMR,
    complex, dimension(nsmr/3,3) GSB2 )

```

Here is the caller graph for this function:

4.1.1.71 `mtrx_spss()`

```

subroutine mtrx_spss (
    integer NSMR,
    integer MLAYER,
    real, dimension(0:mlayer) ZBND,

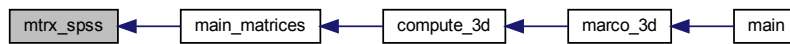
```

```

complex, dimension(0:mlayer) CDH,
complex, dimension(0:mlayer) CDV,
real SBX,
real SBY,
real SBZ,
integer NXS,
integer NYS,
integer NZS,
real ZSB,
integer NMAX,
integer N,
integer NXMAX,
integer NYMAX,
integer NZMAX,
integer, dimension(sub_block) NX,
integer, dimension(sub_block) NY,
integer, dimension(sub_block) NZ,
integer, dimension(sub_block) NCELL,
integer NSUBCM,
integer SUB_BLOCK,
real, dimension(nxmax,sub_block) X,
real, dimension(nymax,sub_block) Y,
real, dimension(nzmax,sub_block) Z,
complex, dimension(nsubcm,sub_block) CDB,
integer KSYM,
complex, dimension(nmax,n) G,
complex, dimension(nsmr/3,3) GSB2 )

```

Here is the caller graph for this function:



4.1.1.72 mtrx_spssm()

```

subroutine mtrx_spssm (
    real SBX,
    real SBY,
    real SBZ,
    integer NXS,
    integer NYS,
    integer NZS,
    real ZSB,
    integer NMAX,
    integer N,
    integer NXMAX,
    integer NYMAX,
    integer NZMAX,
    integer, dimension(sub_block1) NX1,

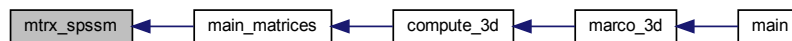
```

```

integer, dimension(sub_block1) NY1,
integer, dimension(sub_block1) NZ1,
integer, dimension(sub_block1) NCELL1,
integer SUB_BLOCK1,
real, dimension(nxmax,sub_block1) X1,
real, dimension(nymax,sub_block1) Y1,
real, dimension(nzmax,sub_block1) Z1,
integer, dimension(sub_block2) NX2,
integer, dimension(sub_block2) NY2,
integer, dimension(sub_block2) NZ2,
integer, dimension(sub_block2) NCELL2,
integer SUB_BLOCK2,
real, dimension(nxmax,sub_block2) X2,
real, dimension(nymax,sub_block2) Y2,
real, dimension(nzmax,sub_block2) Z2,
integer KSYM,
complex, dimension(nmax,n) G,
integer NSMR,
complex, dimension(nsmr/3,3) GSB2 )

```

Here is the caller graph for this function:



4.1.1.73 mtrx_spssm2()

```

subroutine mtrx_spssm2 (
    real SBX,
    real SBY,
    real SBZ,
    integer NXS,
    integer NYS,
    integer NZS,
    real ZSB,
    integer NMAX,
    integer NJ,
    integer N,
    integer NXMAX,
    integer NYMAX,
    integer NZMAX,
    integer, dimension(sub_block1) NX1,
    integer, dimension(sub_block1) NY1,
    integer, dimension(sub_block1) NZ1,
    integer, dimension(sub_block1) NCELL1,
    integer SUB_BLOCK1,
    real, dimension(nxmax,sub_block1) X1,
    real, dimension(nymax,sub_block1) Y1,
    real, dimension(nzmax,sub_block1) Z1,

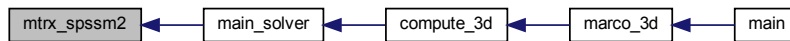
```

```

integer, dimension(sub_block2) NX2,
integer, dimension(sub_block2) NY2,
integer, dimension(sub_block2) NZ2,
integer, dimension(sub_block2) NCELL2,
integer SUB_BLOCK2,
real, dimension(nxmax,sub_block2) X2,
real, dimension(nymax,sub_block2) Y2,
real, dimension(nzmax,sub_block2) Z2,
integer KPOL,
complex, dimension(nmax,n) G,
integer NSMR,
complex, dimension(nsmr/3,3) GSB2 )

```

Here is the caller graph for this function:



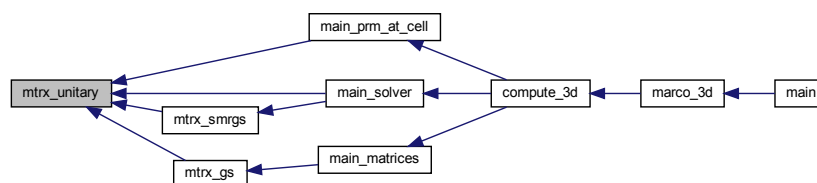
4.1.1.74 mtrx_unitary()

```

subroutine mtrx_unitary (
    integer PR,
    integer QR,
    integer I,
    integer PC,
    integer QC,
    integer J,
    real U )

```

Here is the caller graph for this function:



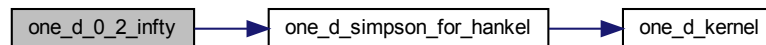
4.1.1.75 one_d_0_2_infty()

```

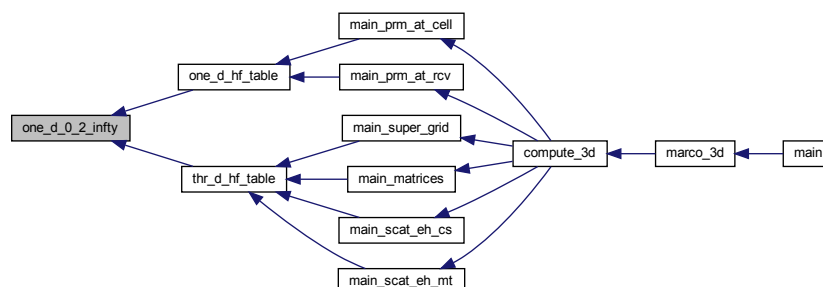
subroutine one_d_0_2_infty (
    integer, intent(in) KEYG,
    integer, intent(in) KEMD,
    integer, intent(in) MLAYER,
    real, dimension(0:mlayer), intent(in) ZBND,
    real, dimension(mlayer), intent(in) LRYTH,
    real, dimension(0:mlayer), intent(in) HVK,
    complex, dimension(0:mlayer), intent(in) KKH,
    integer, intent(in) KANIS,
    integer, intent(in) KPRM,
    integer, intent(in) KITG,
    integer, intent(in) KCHRG,
    integer, intent(in) NOB,
    integer, intent(in) NSR,
    real, intent(in) ZOB,
    real, intent(in) ZSRH,
    real, intent(in) ZSRL,
    real, intent(in) ALMAX,
    integer, intent(in) KEH,
    complex, dimension(4), intent(out) S )

```

Here is the call graph for this function:



Here is the caller graph for this function:



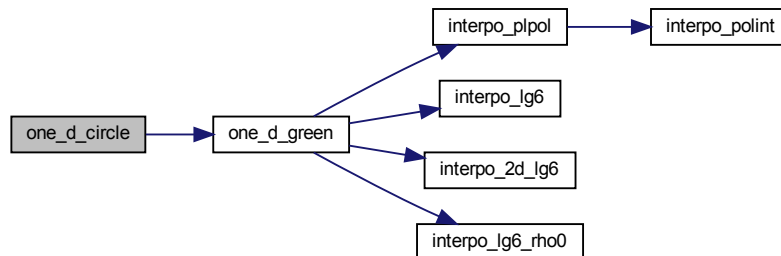
4.1.1.76 one_d_circle()

```

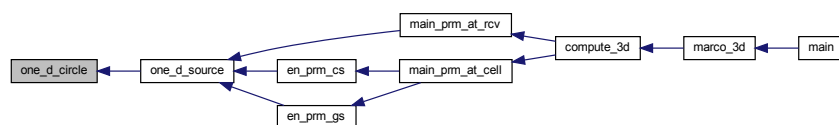
subroutine one_d_circle (
    real, intent(in) THETA,
    real, intent(in) RAD,
    real, intent(in) AJ,
    integer, intent(out) NF,
    complex, dimension(6), intent(out) F,
    integer, intent(in) CS_TYPE,
    integer, intent(in) KEMD,
    integer, intent(in) KEYG,
    real, dimension(8), intent(in) PSTION,
    real, intent(in) FRQ,
    integer, intent(in) MLAYER,
    real, dimension(0:mlayer), intent(in) ZBND,
    complex, dimension(0:mlayer), intent(in) KKH,
    complex, dimension(0:mlayer), intent(in) CDH,
    integer, intent(in) NZOB,
    real, dimension(nzob), intent(in) ZOBG,
    integer, intent(in) NZSR,
    real, dimension(2,nzsr), intent(in) ZSRG,
    real, intent(in) RHOMIN,
    integer, intent(in) NHFILM,
    real, dimension(nrg), intent(in) RRG,
    integer, intent(in) NRG,
    complex, dimension(11,nhfilm,nzsr,nzob), intent(in) GRHF,
    complex, dimension(4,nzsr,nzob), intent(in) GRHOO )

```

Here is the call graph for this function:



Here is the caller graph for this function:



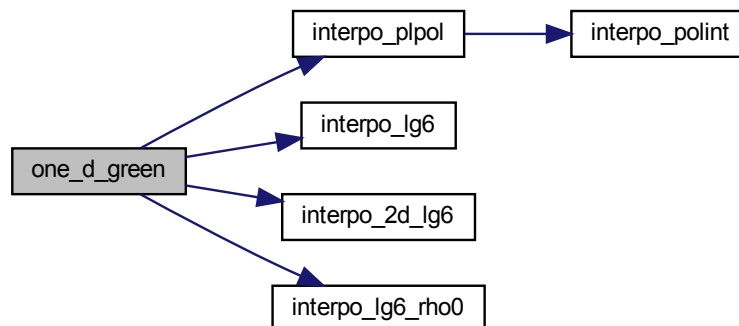
4.1.1.77 one_d_green()

```

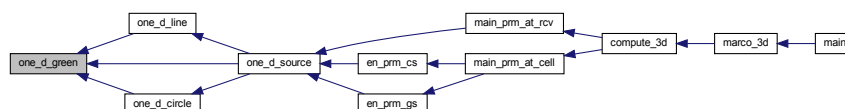
subroutine one_d_green (
    integer, intent(in) CS_TYPE,
    integer, intent(in) KEMD,
    integer, intent(in) KEYG,
    real, dimension(8), intent(in) PSTION,
    real, intent(in) FRQ,
    integer, intent(in) MLAYER,
    real, dimension(0:mayer), intent(in) ZBND,
    complex, dimension(0:mayer), intent(in) KKH,
    complex, dimension(0:mayer), intent(in) CDH,
    integer, intent(in) NZOB,
    real, dimension(nzob), intent(in) ZOBG,
    integer, intent(in) NZSR,
    real, dimension(2,nzsr), intent(in) ZSRG,
    real, intent(in) RHOMIN,
    integer, intent(in) NHFILM,
    real, dimension(nrg) RRG,
    integer, intent(in) NRG,
    complex, dimension(11,nhfilm,nzsr,nzob), intent(in) GRHF,
    complex, dimension(4,nzsr,nzob), intent(in) GRH00,
    complex, dimension(9), intent(out) ECOMP,
    complex, dimension(9), intent(out) HCOMP )

```

Here is the call graph for this function:



Here is the caller graph for this function:



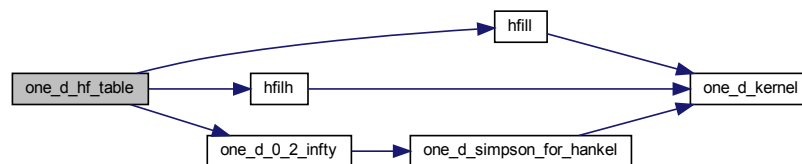
4.1.1.78 one_d_hf_table()

```

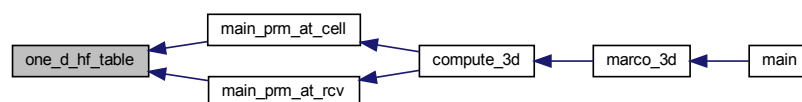
subroutine one_d_hf_table (
    integer, intent(in) HIGH_FRQ,
    integer, intent(in) NHFILM,
    integer, intent(in) MLAYER,
    real, dimension(0:mlayer), intent(in) ZBND,
    real, dimension(mlayer), intent(in) LRYTH,
    real, dimension(0:mlayer), intent(in) HVK,
    complex, dimension(0:mlayer), intent(in) KKH,
    integer, intent(in) KANIS,
    real, intent(in) BLMIN,
    integer, intent(in) CS_TYPE,
    integer, intent(in) KEYG,
    real, intent(in) DMIN,
    real, intent(in) RHOMIN,
    real, intent(in) RHOMAX,
    integer, intent(in) NZOB,
    real, dimension(nzob), intent(in) ZOBG,
    integer, intent(in) NZSR,
    real, dimension(2,nzsr), intent(in) ZSRG,
    integer, intent(in) NZBG,
    real, dimension(2,nzbg), intent(inout) ZBG,
    real, intent(in) ALMAX,
    complex, dimension(11,nhfilm,nzsr,nzob), intent(inout) GRHF,
    real, dimension(nhfilm), intent(inout) RRG,
    integer, intent(inout) NRG,
    complex, dimension(4,nzsr,nzob), intent(inout) GRHOO )

```

Here is the call graph for this function:



Here is the caller graph for this function:



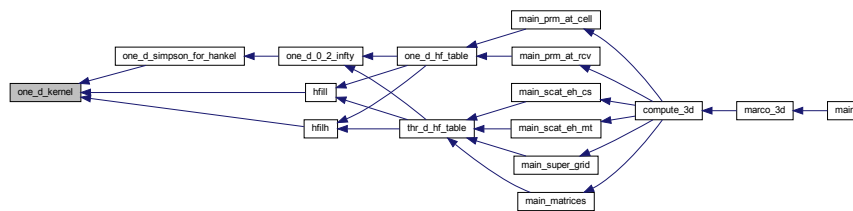
4.1.1.79 one_d_kernel()

```

subroutine one_d_kernel (
    integer, intent(in) KEYG,
    integer, intent(in) KEMD,
    integer, intent(in) MLAYER,
    real, dimension(0:mlayer), intent(in) ZBND,
    real, dimension(mlayer), intent(in) LRYTH,
    real, dimension(0:mlayer), intent(in) HVK,
    complex, dimension(0:mlayer), intent(in) KKH,
    integer, intent(in) KANIS,
    integer, intent(in) KPRM,
    integer, intent(in) KRHO,
    integer, intent(in) KITG,
    integer, intent(in) KCHRG,
    integer, intent(in) NOB,
    integer, intent(in) NSR,
    real, intent(in) ZOB,
    real, intent(in) ZSR,
    real, intent(in) ZSRH,
    real, intent(in) ZSRL,
    real, intent(in) LUMBDA,
    complex, dimension(11), intent(out) FKNS )

```

Here is the caller graph for this function:



4.1.1.80 one_d_line()

```

subroutine one_d_line (
    real X,
    real, intent(in) AJXYZ,
    real, intent(in) AJ,
    integer, intent(out) NF,
    complex, dimension(6), intent(out) F,
    integer, intent(in) CS_TYPE,
    integer, intent(in) KEMD,
    integer, intent(in) KEYG,
    real, dimension(10), intent(in) PSTION,
    real, intent(in) FRQ,
    integer, intent(in) MLAYER,
    real, dimension(0:mlayer), intent(in) ZBND,
    complex, dimension(0:mlayer), intent(in) KKH,

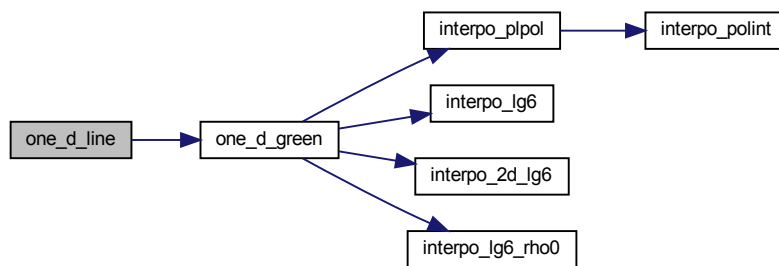
```

```

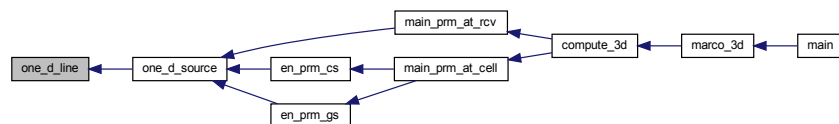
complex, dimension(0:mlayer), intent(in) CDH,
integer, intent(in) NZOB,
real, dimension(nzob), intent(in) ZOBG,
integer, intent(in) NZSR,
real, dimension(2,nzsr), intent(in) ZSRG,
real, intent(in) RHOMIN,
integer, intent(in) NHFILM,
real, dimension(nrg), intent(in) RRG,
integer, intent(in) NRG,
complex, dimension(11,nhfilm,nzsr,nzob), intent(in) GRHF,
complex, dimension(4,nzsr,nzob), intent(in) GRHO0 )

```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.81 one_d_simps()

```

subroutine one_d_simps (
    real, intent(in) A,
    real, intent(in) B,
    real, intent(in) EPS,
    integer N,
    external FK,
    complex, dimension(6), intent(out) S,
    real, intent(in) RDJXYZ,
    real, intent(in) AJ,
    integer, intent(in) CS_TYPE,
    integer, intent(in) KEMD,

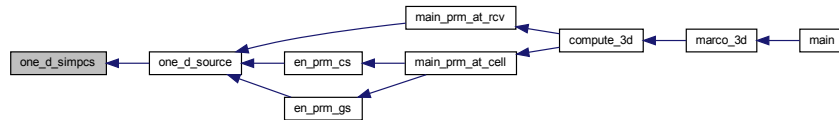
```

```

integer, intent(in) KEYG,
real, dimension(10), intent(in) PSTION,
real, intent(in) FRQ,
integer, intent(in) MLAYER,
real, dimension(0:mlayer), intent(in) ZBND,
complex, dimension(0:mlayer), intent(in) KKH,
complex, dimension(0:mlayer), intent(in) CDH,
integer, intent(in) NZOB,
real, dimension(nzob), intent(in) ZOBG,
integer, intent(in) NZSR,
real, dimension(2,nzsr), intent(in) ZSRG,
real, intent(in) RHOMIN,
integer, intent(in) NHFILM,
real, dimension(nrg), intent(in) RRG,
integer, intent(in) NRG,
complex, dimension(11,nhfilm,nzsr,nzob), intent(in) GRHF,
complex, dimension(4,nzsr,nzob), intent(in) GRHOO )

```

Here is the caller graph for this function:



4.1.1.82 one_d_simpson_for_hankel()

```

subroutine one_d_simpson_for_hankel (
integer, intent(in) KEYG,
integer, intent(in) KEMD,
integer, intent(in) MLAYER,
real, dimension(0:mlayer), intent(in) ZBND,
real, dimension(mlayer), intent(in) LRYTH,
real, dimension(0:mlayer), intent(in) HVK,
complex, dimension(0:mlayer), intent(in) KKH,
integer, intent(in) KANIS,
integer, intent(in) KPRM,
integer, intent(in) KRHO,
integer, intent(in) KITG,
integer, intent(in) KCHRG,
integer, intent(in) NOB,
integer, intent(in) NSR,
real, intent(in) ZOB,
real, intent(in) ZSRH,
real, intent(in) ZSRL,
real, intent(in) A,
real, intent(in) B,
real, intent(in) EPS,
integer K,
integer, intent(out) N,

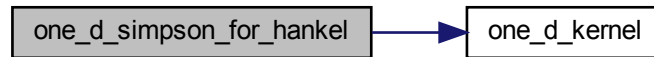
```

```

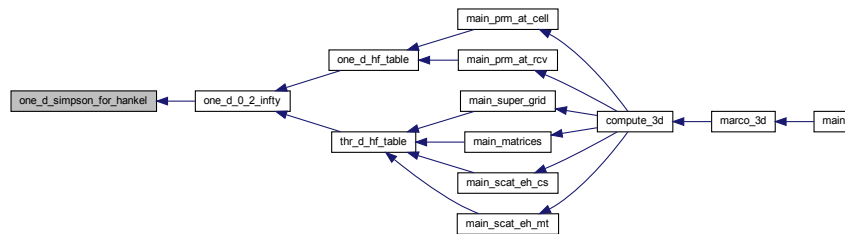
integer, intent(in) KEH,
complex, dimension(4), intent(out) S,
complex, dimension(3), intent(in) ST )

```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.83 one_d_source()

```

subroutine one_d_source (
    integer, intent(in) CS_TYPE,
    real, dimension(2), intent(in) ANGLES,
    real, dimension(3), intent(in) RECVR,
    integer, intent(in) NCRD,
    real, dimension(ncrd), intent(in) TX_CRDX,
    real, dimension(ncrd), intent(in) TX_CRDY,
    real, dimension(ncrd), intent(in) TX_CRDZ,
    real, intent(in) RAD,
    integer, intent(in) KEYG,
    integer, intent(in) KACC,
    real, intent(in) FRQ,
    integer, intent(in) MAYER,
    real, dimension(0:mayer), intent(in) ZBND,
    real, intent(in) AJ,
    complex, dimension(0:mayer), intent(in) KKH,
    complex, dimension(0:mayer), intent(in) CDH,
    integer, intent(in) NZOB,
    real, dimension(nzob), intent(in) ZOBG,
    integer, intent(in) NZSR,

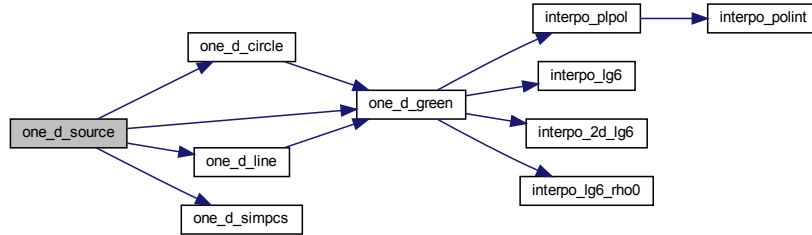
```

```

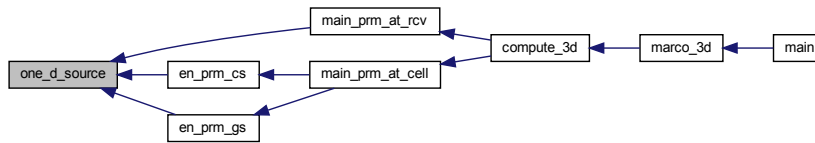
real, dimension(2,nzsr), intent(in) ZSRG,
real, intent(in) RHOMIN,
integer, intent(in) NHFILM,
real, dimension(nrg), intent(in) RRG,
integer, intent(in) NRG,
complex, dimension(11,nhfilm,nzsr,nzob), intent(in) GRHF,
complex, dimension(4,nzsr,nzob), intent(in) GRH00,
complex, dimension(6), intent(out) EHFLD )

```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.84 print_fd()

```

subroutine print_fd (
    integer, intent(in) NW,
    integer, intent(in) PRFL,
    integer, intent(in) M_RX,
    integer, intent(in) NFRQ,
    integer, intent(in) NTX_EVENT,
    integer, dimension(ntx_event), intent(in) N_RX,
    integer, intent(in) SOURCE_TYPE,
    integer, intent(in) SURVEY_TYPE,
    real, dimension(nfrq), intent(in) FREQ,
    integer, intent(in) SUB_RX_MAX,
    integer, intent(in) SUB_BIPOLE,
    real, dimension(sub_rx_max,m_rx,ntx_event), intent(in) RX_X,
    real, dimension(sub_rx_max,m_rx,ntx_event), intent(in) RX_Y,
    real, dimension(sub_rx_max,m_rx,ntx_event), intent(in) RX_Z,

```

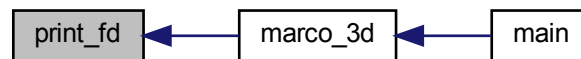


```

integer, dimension(ntx_event), intent(in) N_SIDE,
integer, intent(in) NCRD,
real, intent(in) RXOE,
real, intent(in) RXON,
real, intent(in) RXOZ,
integer, dimension(m_rx,ntx_event), intent(in) RX_TYPE_INDEX,
real, dimension(ncrd,ntx_event), intent(in) TX_CRDX,
real, dimension(ncrd,ntx_event), intent(in) TX_CRDY,
real, dimension(ncrd,ntx_event), intent(in) TX_CRDZ,
real, dimension(2,ntx_event), intent(in) MD_ANGLE,
integer, intent(in) DO3D,
complex, dimension(m_rx,ntx_event,nfrq), intent(in) HPX,
complex, dimension(m_rx,ntx_event,nfrq), intent(in) HPY,
complex, dimension(m_rx,ntx_event,nfrq), intent(in) HPZ,
complex, dimension(m_rx,ntx_event,nfrq), intent(in) VOLTP,
complex, dimension(m_rx,ntx_event,nfrq), intent(in) HSX,
complex, dimension(m_rx,ntx_event,nfrq), intent(in) HSY,
complex, dimension(m_rx,ntx_event,nfrq), intent(in) HSZ,
complex, dimension(m_rx,ntx_event,nfrq), intent(in) VOLTS )

```

Here is the caller graph for this function:



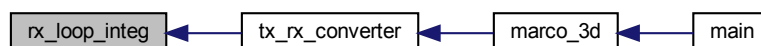
4.1.1.85 rx_loop_integ()

```

subroutine rx_loop_integ (
    integer, intent(in) NVRTX,
    real, dimension(3,nvrtx), intent(in) VERTEX,
    integer, intent(in) ACCURACY,
    integer, intent(in) NINTEG_MAX,
    integer, intent(out) NINTEG,
    real, dimension(3,ninteg_max), intent(out) INTEG_POINTS,
    real, dimension(3,ninteg_max), intent(out) INTEG_WEIGHTS )

```

Here is the caller graph for this function:



4.1.1.86 scat_eh_cs()

```

subroutine scat_eh_cs (
    integer, intent(in) SUB_RX_MAX,
    integer, dimension(m_rx,ntxe), intent(in) RX_TYPE_INDEX,
    integer, dimension(m_rx,ntxe) N_SUB_RX,
    real, dimension(3,sub_rx_max,m_rx,ntxe), intent(in) RX_WEIGHT,
    integer NBMAX,
    integer NMAX,
    integer NXMAX,
    integer NYMAX,
    integer NZMAX,
    integer NBODY,
    integer, dimension(nbody) SUB_BLOCK,
    integer, dimension(ntxe) N_RX,
    real, dimension(sub_rx_max,m_rx,ntxe), intent(in) RX_X,
    real, dimension(sub_rx_max,m_rx,ntxe), intent(in) RX_Y,
    real, dimension(sub_rx_max,m_rx,ntxe), intent(in) RX_Z,
    integer, dimension(nbmax,nbody) NX,
    integer, dimension(nbmax,nbody) NY,
    integer, dimension(nbmax,nbody) NZ,
    integer, dimension(nbmax,nbody) NCELL,
    real, dimension(nxmax,nbmax,nbody) X,
    real, dimension(nymax,nbmax,nbody) Y,
    real, dimension(nzmax,nbmax,nbody) Z,
    real, dimension(nbmax,nbody) CLX,
    real, dimension(nbmax,nbody) CLY,
    real, dimension(nbmax,nbody) CLZ,
    complex, dimension(nmax,nbody) JS,
    integer NSUBCM,
    complex, dimension(nsubcm,nbmax,nbody) CDB,
    integer IEXCI,
    real, dimension(nbody) CLMN,
    integer M_RX,
    integer NTXE,
    complex, dimension(m_rx) VLT,
    complex, dimension(m_rx,ntxe) ENX,
    complex, dimension(m_rx,ntxe) ENY,
    complex, dimension(m_rx,ntxe) ENZ,
    complex, dimension(m_rx) EAX,
    complex, dimension(m_rx) EAY,
    complex, dimension(m_rx) EAZ,
    complex, dimension(m_rx) HAX,
    complex, dimension(m_rx) HAY,
    complex, dimension(m_rx) HAZ,
    real FRQ,
    integer MLAYER,
    real, dimension(0:mlayer) ZBND,
    complex, dimension(0:mlayer) CDH,
    complex, dimension(0:mlayer) CDV,
    real, dimension(0:mlayer) HVK,
    real, dimension(mlayer) RMU_LYR,
    integer NZOB,
    real, dimension(nzob) ZOBG,
    integer NZSR,
    real, dimension(2,nzsr) ZSRG,
    real RHOMIN,
    real DMIN,

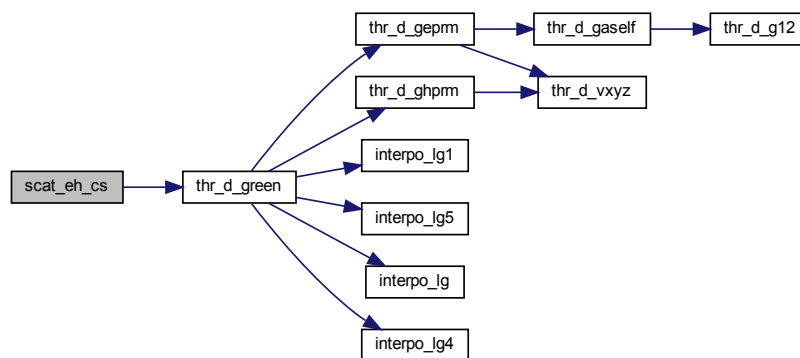
```

```

integer NHFILM,
real, dimension(nrg) RRG,
integer NRG,
complex, dimension(11,nhfilm,nzsr,nzob) GRHF,
real, dimension(nrg3) RRG3,
integer NRG3,
complex, dimension(11,nhfilm,nzsr) GRHF3,
complex, dimension(4,nzsr,nzob) GRH00,
complex, dimension(4,nzsr) GRH003,
integer KCLMN,
real BLMIN,
integer KACC )

```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.87 scat_eh_csgs()

```

subroutine scat_eh_csgs (
    integer, intent(in) SUB_RX_MAX,
    integer, dimension(m_rx,ntxe), intent(in) RX_TYPE_INDEX,
    integer, dimension(m_rx,ntxe) N_SUB_RX,
    real, dimension(3,sub_rx_max,m_rx,ntxe), intent(in) RX_WEIGHT,
    integer NBMAX,
    integer NEQ,
    integer NXMAX,
    integer NYMAX,

```

```

integer NZMAX,
integer NBODY,
integer, dimension(nbody) SUB_BLOCK,
integer, dimension(nbody) NET,
integer, dimension(ntax) N_RX,
real, dimension(sub_rx_max,m_rx,ntax), intent(in) RX_X,
real, dimension(sub_rx_max,m_rx,ntax), intent(in) RX_Y,
real, dimension(sub_rx_max,m_rx,ntax), intent(in) RX_Z,
integer, dimension(nbmax,nbody) NX,
integer, dimension(nbmax,nbody) NY,
integer, dimension(nbmax,nbody) NZ,
integer, dimension(nbmax,nbody) NCELL,
real, dimension(nxmax,nbmax,nbody) X,
real, dimension(nymax,nbmax,nbody) Y,
real, dimension(nzmax,nbmax,nbody) Z,
real, dimension(nbmax,nbody) CLX,
real, dimension(nbmax,nbody) CLY,
real, dimension(nbmax,nbody) CLZ,
complex, dimension(4*neq) JS,
integer NSUBCM,
complex, dimension(nsubcm,nbmax,nbody) CDB,
integer IEXCI,
real, dimension(nbody) CLMN,
integer M_RX,
integer NTXE,
complex, dimension(m_rx) VLT,
complex, dimension(m_rx,ntax) ENX,
complex, dimension(m_rx,ntax) ENY,
complex, dimension(m_rx,ntax) ENZ,
complex, dimension(m_rx) EAX,
complex, dimension(m_rx) EAY,
complex, dimension(m_rx) EAZ,
complex, dimension(m_rx) HAX,
complex, dimension(m_rx) HAY,
complex, dimension(m_rx) HAZ,
real FRQ,
integer MLAYER,
real, dimension(0:mayer) ZBND,
complex, dimension(0:mayer) CDH,
complex, dimension(0:mayer) CDV,
real, dimension(0:mayer) HVK,
real, dimension(mayer) RMU_LYR,
integer NZOB,
real, dimension(nzob) ZOBG,
integer NZSR,
real, dimension(2,nzsr) ZSRG,
real RHOMIN,
real DMIN,
integer NHFILM,
real, dimension(nrg) RRG,
integer NRG,
complex, dimension(11,nhfilm,nzsr,nzob) GRHF,
real, dimension(nrg3) RRG3,
integer NRG3,
complex, dimension(11,nhfilm,nzsr) GRHF3,
complex, dimension(4,nzsr,nzob) GRH00,
complex, dimension(4,nzsr) GRH003,
integer KCLMN,

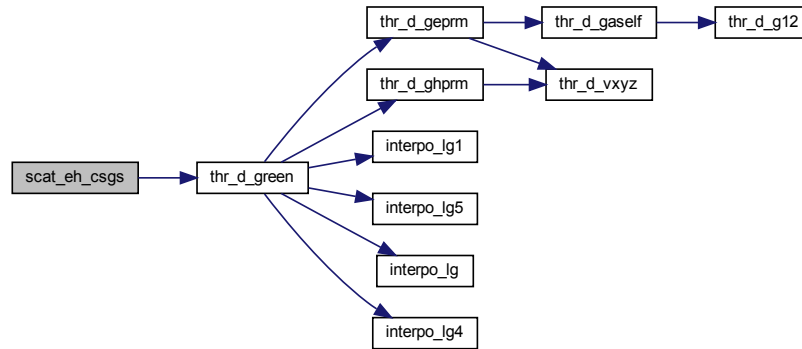
```

```

real BLMIN,
integer KACC )

```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.88 scat_eh_mt()

```

subroutine scat_eh_mt (
    integer NBMAX,
    integer NMAX,
    integer NXMAX,
    integer NYMAX,
    integer NZMAX,
    integer NBODY,
    integer, dimension(nbody) SUB_BLOCK,
    integer MT_PROFL,
    integer MT_STATN,
    real, dimension(mt_profl) XRMT,
    real, dimension(mt_statn) YRMT,
    integer, dimension(nbmax,nbody) NX,
    integer, dimension(nbmax,nbody) NY,
    integer, dimension(nbmax,nbody) NZ,
    integer, dimension(nbmax,nbody) NCELL,
    real, dimension(nxmax,nbmax,nbody) X,
    real, dimension(nymax,nbmax,nbody) Y,
    real, dimension(nzmax,nbmax,nbody) Z,
    real, dimension(nbmax,nbody) CLX,

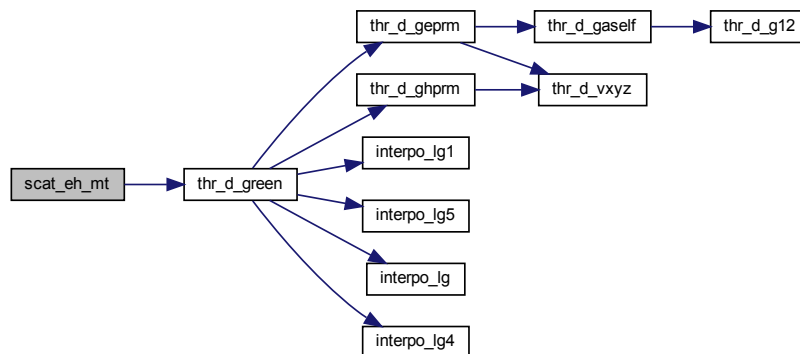
```

```

real, dimension(nbmax,nbody) CLY,
real, dimension(nbmax,nbody) CLZ,
complex, dimension(nmax,nbody) JS,
integer NPOL,
integer KSFT,
integer NSUBCM,
complex, dimension(nsubcm,nbmax,nbody) CDB,
real, dimension(nbody) CLMN,
real ZMT,
complex EOX1,
complex EOY1,
complex, dimension(mt_profl,mt_statn,2) EXMT,
complex, dimension(mt_profl,mt_statn,2) EYMT,
complex, dimension(mt_profl,mt_statn,2) HXMT,
complex, dimension(mt_profl,mt_statn,2) HYMT,
complex, dimension(mt_profl,mt_statn,2) HZMT,
real FRQ,
integer MLAYER,
real, dimension(0:mayer) ZBND,
complex, dimension(0:mayer) CDH,
real, dimension(0:mayer) HVK,
integer NZOB,
real, dimension(nzob) ZOBG,
integer NZSR,
real, dimension(2,nzsr) ZSRG,
real RHOMIN,
real DMIN,
integer NHFILM,
real, dimension(nrg) RRG,
integer NRG,
complex, dimension(11,nhfilm,nzsr,nzob) GRHF,
real, dimension(nrg3) RRG3,
integer NRG3,
complex, dimension(11,nhfilm,nzsr) GRHF3,
complex, dimension(4,nzsr,nzob) GRHO0,
complex, dimension(4,nzsr) GRHO03,
integer KCLMN,
real BLMIN,
integer KACC )

```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.89 scat_eh_mts()

```

subroutine scat_eh_mts (
    integer NBMAX,
    integer NMAX,
    integer NXMAX,
    integer NYMAX,
    integer NZMAX,
    integer NBODY,
    integer, dimension(nbody) SUB_BLOCK,
    integer MT_PROFL,
    integer MT_STATN,
    real, dimension(mt_profl) XRMT,
    real, dimension(mt_statn) YRMT,
    integer, dimension(nbmax,nbody) NX,
    integer, dimension(nbmax,nbody) NY,
    integer, dimension(nbmax,nbody) NZ,
    integer, dimension(nbmax,nbody) NCELL,
    real, dimension(nxmax,nbmax,nbody) X,
    real, dimension(nymax,nbmax,nbody) Y,
    real, dimension(nzmax,nbmax,nbody) Z,
    real, dimension(nbmax,nbody) CLX,
    real, dimension(nbmax,nbody) CLY,
    real, dimension(nbmax,nbody) CLZ,
    complex, dimension(nmax,nbody) JS,
    integer NPOL,
    integer KSFT,
    integer NSUBCM,
    complex, dimension(nsubcm,nbmax,nbody) CDB,
    real, dimension(nbody) CLMN,
    real ZMT,
    complex EOX1,
    complex EOY1,
    complex, dimension(mt_profl,mt_statn,2) EXMT,
    complex, dimension(mt_profl,mt_statn,2) EYMT,
    complex, dimension(mt_profl,mt_statn,2) HXMT,
    complex, dimension(mt_profl,mt_statn,2) HYMT,
    complex, dimension(mt_profl,mt_statn,2) HZMT,
    real FRQ,
    integer MLAYER,
    real, dimension(0:mlayer) ZBND,
    complex, dimension(0:mlayer) CDH,
    real, dimension(0:mlayer) HVK,
    integer NZOB,

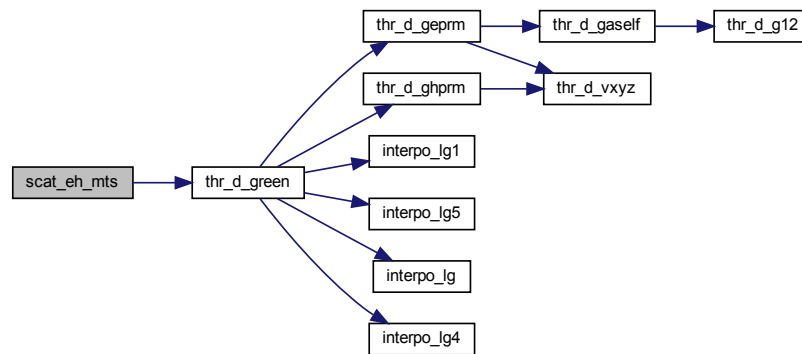
```

```

real, dimension(nzob) ZOBG,
integer NZSR,
real, dimension(2,nzsr) ZSRG,
real RHOMIN,
real DMIN,
integer NHFILM,
real, dimension(nrg) RRG,
integer NRG,
complex, dimension(11,nhfilm,nzsr,nzob) GRHF,
real, dimension(nrg3) RRG3,
integer NRG3,
complex, dimension(11,nhfilm,nzsr) GRHF3,
complex, dimension(4,nzsr,nzob) GRH00,
complex, dimension(4,nzsr) GRH003,
integer KCLMN,
real BLMIN,
integer KACC )

```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.90 sdot()

```

complex function sdot (
    integer N,
    complex, dimension(n) SX,
    integer INCX,
    complex, dimension(n) SY,
    integer INCY )

```

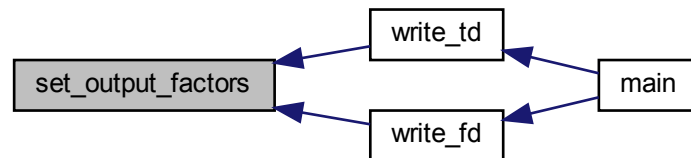

4.1.1.91 set_output_factors()

```

subroutine set_output_factors (
    integer NRXG,
    integer MRX,
    integer SURVEY_TYPE,
    integer, dimension(nrxg) RX_TYPE,
    real, dimension(mrx,nrxg) RXMNT,
    integer STEP,
    integer, dimension(nrxg) UNITS,
    character(len=16), dimension(nrxg) OUTTXT,
    real, dimension(mrx,nrxg) UTFAC,
    character (len = 06), dimension(nrxg) AMR_UNITS )

```

Here is the caller graph for this function:



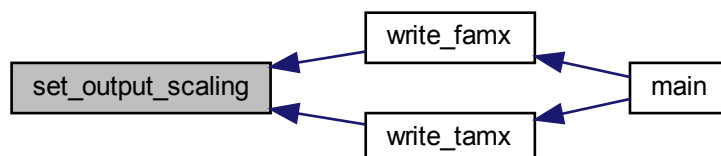
4.1.1.92 set_output_scaling()

```

subroutine set_output_scaling (
    integer, intent(in) NRXG,
    integer, intent(in) MRX,
    integer, intent(in) SURVEY_TYPE,
    integer, dimension(nrxg), intent(in) RX_TYPE,
    real, dimension(mrx, nrxg), intent(in) RXMNT,
    integer, intent(in) STEP,
    integer, dimension(nrxg), intent(in) UNITS,
    real, dimension(mrx, nrxg), intent(out) OUT_SCALE,
    character (len = 04), dimension(nrxg), intent(out) OUT_UNITS )

```

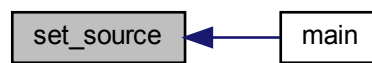
Here is the caller graph for this function:



4.1.1.93 set_source()

```
subroutine set_source (  
    integer, intent(in) NSX,  
    real, dimension(nsx), intent(in) SWX,  
    real, dimension(nsx,3), intent(inout) SWY,  
    real TOSX )
```

Here is the caller graph for this function:



4.1.1.94 structuring()

```
subroutine compute_3d::structuring ( )
```

Here is the caller graph for this function:



4.1.1.95 tdem_3d()

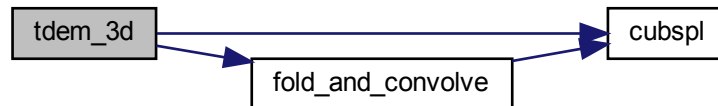
```
subroutine tdem_3d (  
    integer STEP,  
    integer NSX,  
    real, dimension(nsx) SWX,  
    real, dimension(nsx,3) SWY,  
    integer NPULS,  
    real PULSE,  
    integer NTYPLS,
```

```

integer NTYRP,
real, dimension(ntyrrp) TRP,
integer NCHNL,
real, dimension(nchnl) TOPN,
real, dimension(nchnl) TCLS,
real, dimension(nfrq) FREQ,
integer NFRQ,
integer KFRQE,
integer NTXE,
integer LRX,
integer, dimension(ntyrrp) NRXTX,
integer, dimension(lrx,ntyrrp) RXID,
integer, dimension(lrx,ntyrrp) NCMP,
complex, dimension(nfrq,lrx,ntyrrp,3) BFD1,
real, dimension(nchnl,lrx,ntyrrp,3) BTD1 )

```

Here is the call graph for this function:



Here is the caller graph for this function:



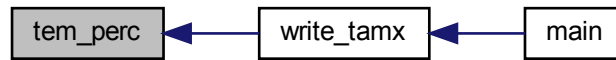
4.1.1.96 tem_perc()

```

subroutine tem_perc (
integer, intent(in) NCHNL,
integer, intent(in) NSTNS,
real, dimension(nchnl, nstns), intent(in) NUM,
real, dimension(nchnl, nstns), intent(in) DEN,
real, dimension(nchnl, nstns), intent(out) PRC )

```

Here is the caller graph for this function:

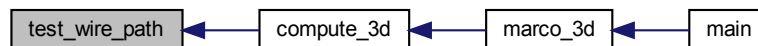


4.1.1.97 test_wire_path()

```

subroutine test_wire_path (
    integer, intent(in) SOURCE_TYPE,
    real, intent(in) DMIN,
    integer, intent(in) NCRD,
    integer, intent(in) NTXE,
    real, dimension(ncrd,ntxe), intent(in) TX_CRDX,
    real, dimension(ncrd,ntxe), intent(in) TX_CRDY,
    real, dimension(ncrd,ntxe), intent(in) TX_CRDZ,
    integer, intent(out) WIRE_PATH,
    integer, intent(out) CS_TYPE )
  
```

Here is the caller graph for this function:

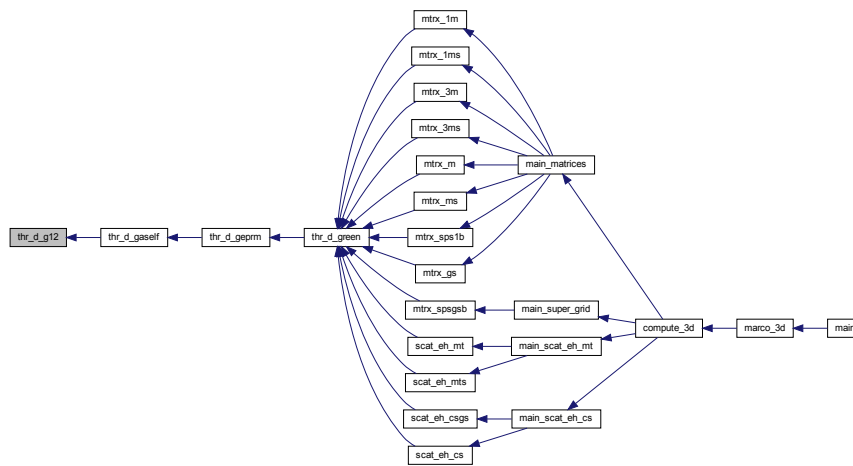


4.1.1.98 thr_d_g12()

```

subroutine thr_d_g12 (
    real CLX,
    real CLY,
    real CLZ,
    complex CDH,
    real HVK,
    complex K,
    complex G1,
    complex G2 )
  
```

Here is the caller graph for this function:



4.1.1.99 thr_d_gaself()

```

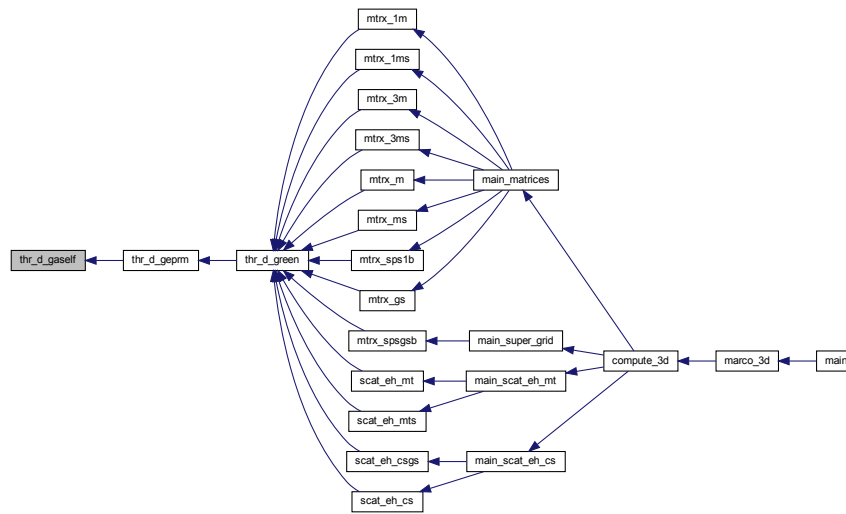
subroutine thr_d_gaself (
    real CLX,
    real CLY,
    real CLZ,
    integer MXINT,
    integer MYINT,
    integer MZINT,
    complex CDH,
    real HVK,
    complex K,
    real DMIN,
    complex GX,
    complex GZ )

```

Here is the call graph for this function:



Here is the caller graph for this function:

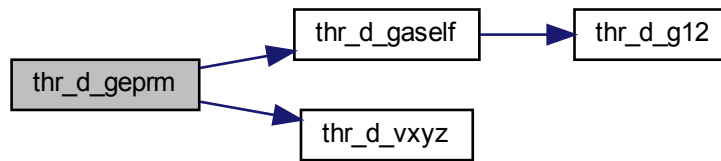


4.1.1.100 thr_d_geprm()

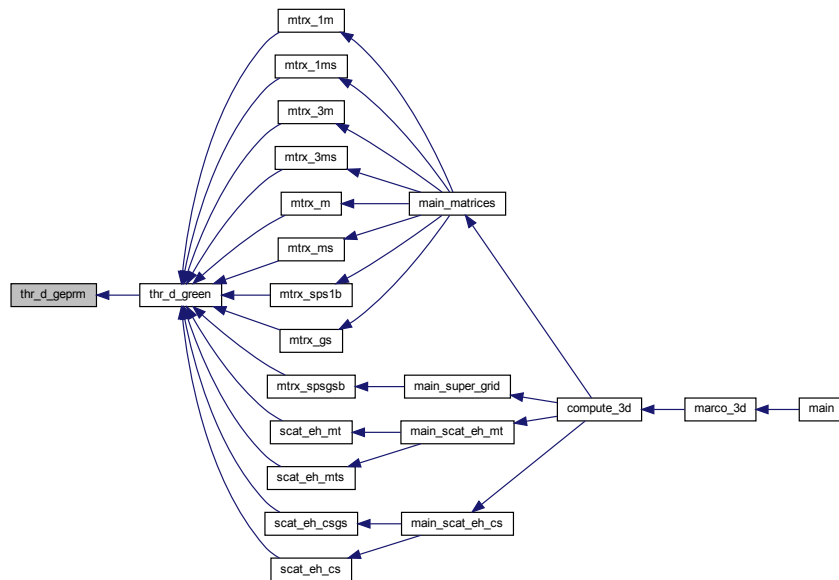
```

subroutine thr_d_geprm (
    real, dimension(6) PSTION,
    integer KACC,
    integer KSELF,
    real CLREF,
    integer MXINT,
    integer MYINT,
    integer MZINT,
    real CLX,
    real CLY,
    real CLZ,
    real FRQ,
    complex CDH,
    real HVK,
    real DMIN,
    complex GAX,
    complex, dimension(9) ECOMP )
  
```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.101 thr_d_ghprm()

```

subroutine thr_d_ghprm (
    real, dimension(6) PSTION,
    integer KACC,
    real BLMIN,
    real CLREF,
    integer MXINT,
    integer MYINT,
    integer MZINT,
    real CLX,
    real CLY,

```

```

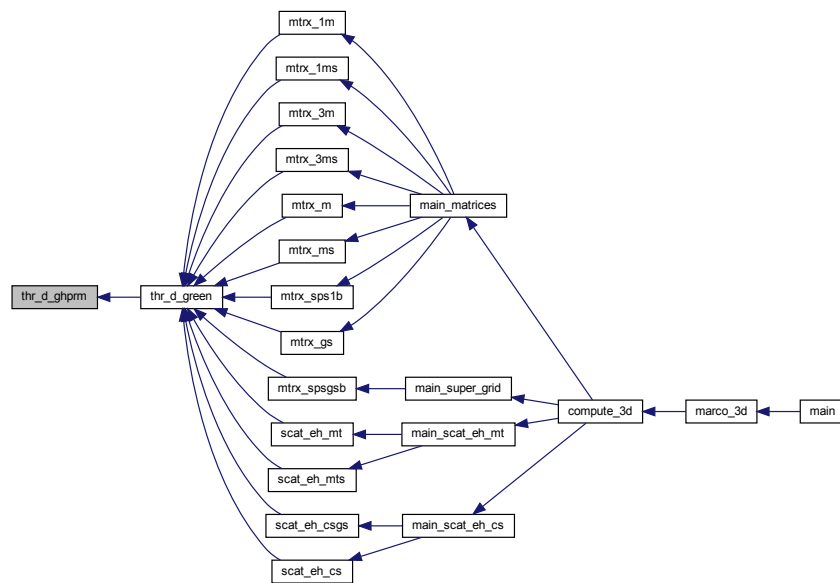
real CLZ,
real FRQ,
complex CDH,
real HVK,
real DMIN,
complex, dimension(9) HCOMP )

```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.102 thr_d_green()

```

subroutine thr_d_green (
    integer KEYG,
    real, dimension(6) PSTION,
    real FRQ,
    integer MLAYER,
    real, dimension(0:mlayer) ZBND,

```

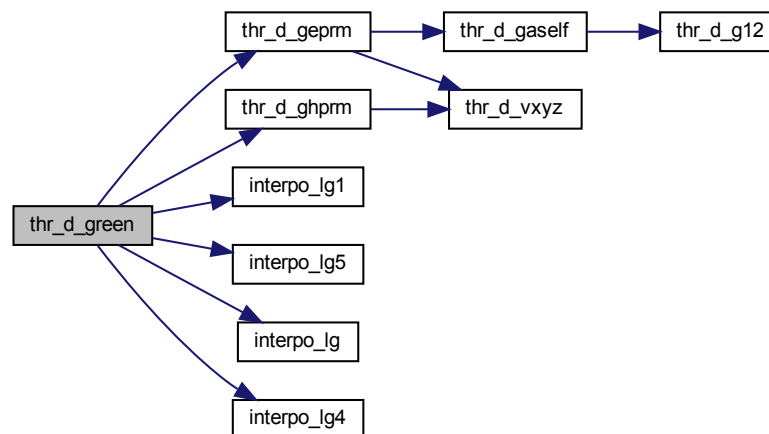


```

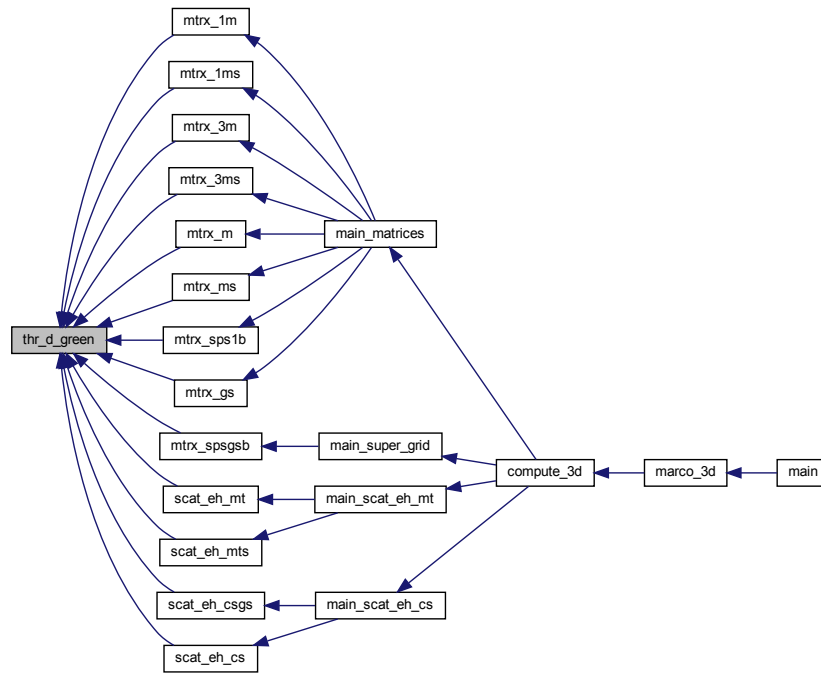
complex, dimension(0:mlayer) CDH,
real, dimension(0:mlayer) HVK,
integer NZOB,
real, dimension(nzob) ZOBG,
integer NZSR,
real, dimension(2,nzsr) ZSRG,
real RHOMIN,
real DMIN,
integer NHFILM,
real, dimension(nrg) RRG,
integer NRG,
complex, dimension(11,nhfilm,nzsr,nzob) GRHF,
real, dimension(nrg3) RRG3,
integer NRG3,
complex, dimension(11,nhfilm,nzsr) GRHF3,
complex, dimension(4,nzsr,nzob) GRH00,
complex, dimension(4,nzsr) GRH003,
real CLX,
real CLY,
real CLZ,
real CLMN,
integer KCLMN,
real BLMIN,
integer KACC,
integer KUTCPR,
integer KSELF,
complex, dimension(9) ECOMP,
complex, dimension(9) HCOMP )

```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.103 thr_d_hf_table()

```

subroutine thr_d_hf_table (
    integer, intent(in) HIGH_FRQ,
    integer, intent(in) NHFILM,
    integer, intent(in) MLAYER,
    real, dimension(0:mlayer), intent(in) ZBND,
    real, dimension(mlayer), intent(in) LRYTH,
    real, dimension(0:mlayer), intent(in) HVK,
    complex, dimension(0:mlayer), intent(in) KKH,
    integer, intent(in) KANIS,
    integer, intent(in) KSFT,
    real, intent(in) BLMIN,
    integer, intent(in) KEYG,
    real, intent(in) DMIN,
    real, intent(in) RHOMIN,
    real, intent(in) RHOMAX,
    integer, intent(in) NZOB,
    real, dimension(nzob), intent(in) ZOBG,
    integer, intent(in) NZSR,
    real, dimension(2,nzsr), intent(in) ZSRG,
    real, intent(in) ALMAX,
    real, dimension(nhfilm), intent(inout) RRG,
    integer, intent(inout) NRG,
    real, dimension(nhfilm), intent(inout) RRG3,

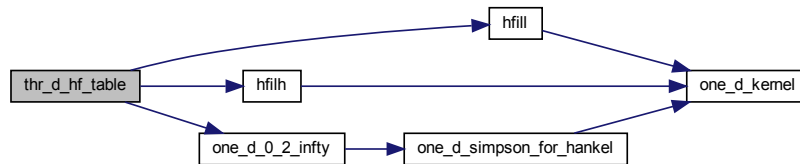
```

```

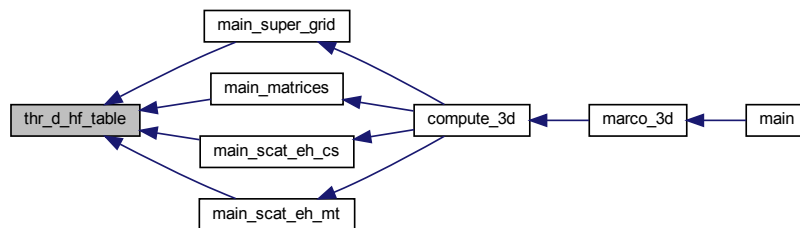
integer, intent(inout) NRG3,
complex, dimension(11,nhfilm,nzsr,nzob), intent(inout) GRHF,
complex, dimension(11,nhfilm,nzsr), intent(inout) GRHF3,
complex, dimension(4,nzsr,nzob), intent(inout) GRH00,
complex, dimension(4,nzsr), intent(inout) GRH003 )

```

Here is the call graph for this function:



Here is the caller graph for this function:



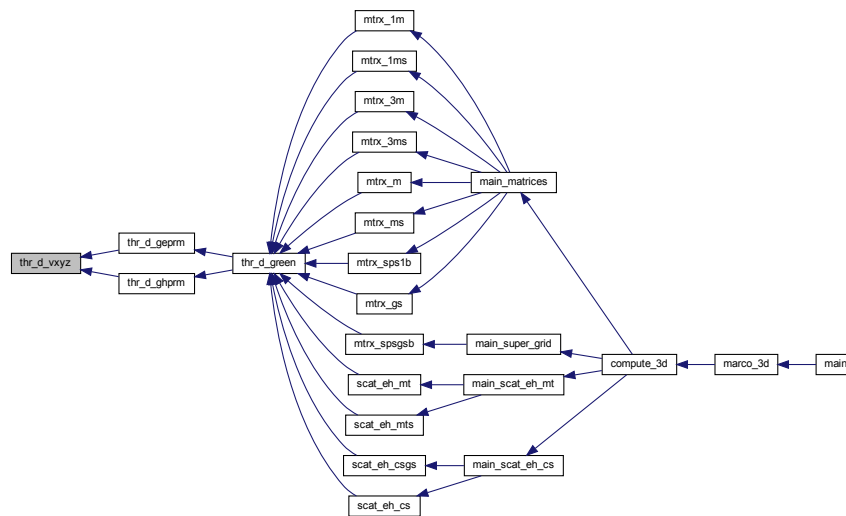
4.1.1.104 thr_d_vxyz()

```

subroutine thr_d_vxyz (
    real CLX,
    real CLY,
    real CLZ,
    real XSR,
    real YSR,
    real ZSR,
    real, dimension(6) XX,
    real, dimension(6) YY,
    real, dimension(6) ZZ )

```

Here is the caller graph for this function:



4.1.1.105 tx_rx_converter()

```

subroutine tx_rx_converter (
    integer SURVEY_TYPE,
    integer SOURCE_TYPE,
    integer NTXE,
    integer MXVRTX,
    integer, dimension (ntxe) N_VRTX,
    real, dimension (mxvrtx,ntxe) SXE,
    real, dimension (mxvrtx,ntxe) SXN,
    real, dimension (mxvrtx,ntxe) SXZ,
    real, dimension (ntxe) SXDIP,
    real, dimension (ntxe) SXAZ,
    integer NRXG,
    integer, dimension (ntxe) NRGTX,
    integer, dimension (nrxg) RX_TYPE,
    integer, dimension (nrxg,ntxe) RGTXID,
    integer, dimension (ntxe) NRXTX,
    integer, dimension (nrxg) NRX,
    integer MRX,
    integer LRX,
    integer MQVR,
    real, dimension (mrx,nrxg,mqvr) RXE,
    real, dimension (mrx,nrxg,mqvr) RXN,
    real, dimension (mrx,nrxg,mqvr) RXZ,
    integer SUB_RX_MAX,
    integer SUB_BIPOLE,
    real, dimension (mxvrtx,ntxe) TX_CRDX,
    real, dimension (mxvrtx,ntxe) TX_CRDY,
    real, dimension (mxvrtx,ntxe) TX_CRDZ,
    real, dimension (2,ntxe) MD_ANGLE,

```

```

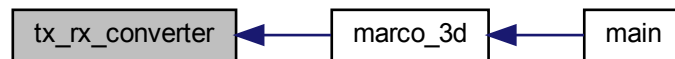
integer, dimension(ntxe) N_RX,
real, dimension(sub_rx_max,lrx,ntxe) RX_X,
real, dimension(sub_rx_max,lrx,ntxe) RX_Y,
real, dimension(sub_rx_max,lrx,ntxe) RX_Z,
integer, dimension(lrx,ntxe) RX_TYPE_INDEX,
integer, dimension(lrx,ntxe) N_SUB_RX,
real, dimension(3,sub_rx_max,lrx,ntxe) RX_WEIGHT,
integer LOOP_INTEG_ACCURACY )

```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.106 txcmrq()

```

subroutine txcmrq (
    integer, intent(in) MXCNV,
    real, dimension(mxcnv), intent(in) X1,
    real, dimension(mxcnv), intent(in) Y1,
    integer, intent(in) N1,
    real, dimension(mxcnv), intent(in) X2,
    real, dimension(mxcnv), intent(in) Y2,
    integer, intent(in) N2,
    real, dimension(mxcnv), intent(out) XCNV,
    real, dimension(4,mxcnv), intent(out) YCNV,
    integer, intent(out) NCNV )

```

Here is the caller graph for this function:

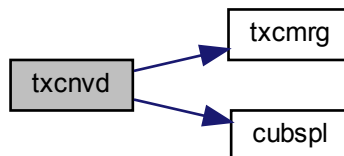


4.1.1.107 txcnvd()

```

real function txcnvd (
    integer, intent(in) MXCNV,
    real, intent(in) T,
    integer, intent(in) NTYPLS,
    real, dimension(ntypls), intent(in) TRP,
    real, dimension(4,ntypls), intent(in) YPLS,
    integer, intent(in) NSX,
    real, dimension(nsx), intent(in) SWX,
    real, dimension(nsx,3), intent(in) SWY,
    integer KI )
  
```

Here is the call graph for this function:



4.1.1.108 txcnvl()

```

real function txcnvl (
    real T,
    integer NTYPLS,
    real, dimension(ntypls) TRP,
    real, dimension(4,ntypls) YPLS,
    integer NSX,
    real, dimension(nsx) SWX,
    real, dimension(nsx,3) SWY )
  
```

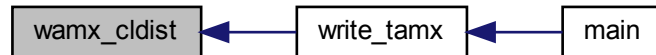
4.1.1.109 wamx_cldist()

```

subroutine wamx_cldist (
    integer, intent(in) NLOC,
    real (kind = dp), dimension(max_comp, nloc), intent(in) RXPLT,
    real (kind = dp), dimension(nloc), intent(inout) SLENG,
    integer, intent(out) STNS )

```

Here is the caller graph for this function:



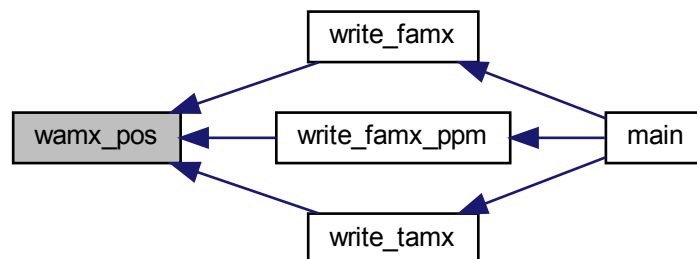
4.1.1.110 wamx_pos()

```

subroutine wamx_pos (
    integer, intent(in) MODE,
    integer, intent(in) MRX,
    integer, intent(in) NRXG,
    integer, intent(in) MQVR,
    integer, intent(in) JX,
    integer, intent(in) JG,
    integer, intent(in) N_CORNR,
    real (kind = dp), dimension(mrx, nrxg, mqvr), intent(in) RXED,
    real (kind = dp), dimension(mrx, nrxg, mqvr), intent(in) RXND,
    real (kind = dp), dimension(mrx, nrxg, mqvr), intent(in) RXZD,
    real (kind = dp), dimension(max_comp, jx), intent(inout) RXPLT,
    real (kind = dp), dimension(jx), intent(inout) SLENG,
    integer, intent(out) STNS )

```

Here is the caller graph for this function:



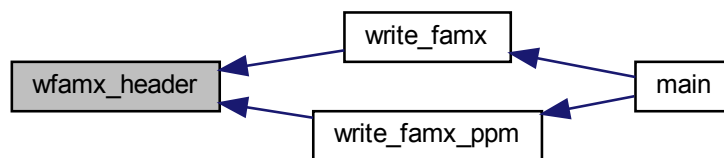
4.1.1.111 wfamx_header()

```

subroutine wfamx_header (
    integer, intent(in) NA,
    integer, intent(in) OUTPUT,
    integer, intent(in) NOUT )

```

Here is the caller graph for this function:



4.1.1.112 wrfdp()

```

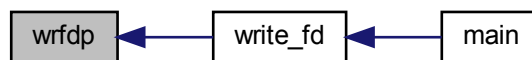
subroutine wrfdp (
    integer NW,
    integer PRFL,
    integer PRTYP,
    integer NFRQ,
    real, dimension(nfrq) FREQ,
    integer NLOC,
    integer NRX1,
    integer JC,
    real(kind=8), dimension(3,nloc) RXPLT,
    real, dimension(nfrq,nloc) YTR )

```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.113 wrfds()

```

subroutine wrfds (
    integer NW,
    integer PRTYP,
    integer NFRQ,
    real, dimension(nfrq) FREQ,
    integer NLOC,
    integer NRX1,
    integer JC,
    real(kind=8), dimension(3,nloc) RXPLT,
    real, dimension(nfrq,nloc) YTR )
  
```

Here is the caller graph for this function:



4.1.1.114 write_famx()

```

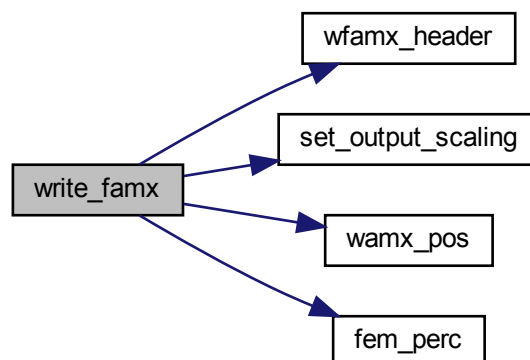
subroutine write_famx (
    character (len = 120), intent(in) TITLE,
    integer, intent(in) STEP,
    integer, intent(in) OUTPUT,
    integer, intent(in) SOURCE_TYPE,
    integer, intent(in) SURVEY_TYPE,
    integer, intent(in) NFRQ,
    real, dimension(nfrq), intent(in) FREQ,
    integer, intent(in) NTXE,
  
```

```

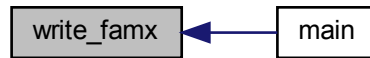
integer, intent(in) MXVRTX,
integer, dimension(ntxe), intent(in) N_VRTX,
real, dimension(mxvrtx, ntxe), intent(in) SXE,
real, dimension(mxvrtx, ntxe), intent(in) SXN,
real, dimension(mxvrtx, ntxe), intent(in) SXZ,
real, dimension(ntxe), intent(in) SXDIP,
real, dimension(ntxe), intent(in) SXAZ,
real, dimension(ntxe), intent(in) SXMNT,
integer, dimension(ntxe), intent(in) NRGTX,
integer, intent(in) NRXG,
integer, dimension(nrxg, ntxe), intent(in) RGTXID,
integer, dimension(nrxg), intent(in) NCMPG,
integer, dimension(10, nrxg), intent(in) PRTCMP,
integer, intent(in) LRX,
integer, intent(in) MRX,
integer, dimension(nrxg), intent(in) NRX,
integer, intent(in) MQVR,
integer, dimension(nrxg), intent(in) RX_TYPE,
integer, dimension(nrxg), intent(in) UNITS,
real (kind = dp), dimension(mrx, nrxg, mqvr), intent(in) RXED,
real (kind = dp), dimension(mrx, nrxg, mqvr), intent(in) RXND,
real (kind = dp), dimension(mrx, nrxg, mqvr), intent(in) RXZD,
real, dimension(mrx, nrxg), intent(in) RXDIP,
real, dimension(mrx, nrxg), intent(in) RXAZ,
real, dimension(mrx, nrxg), intent(in) RXMNT,
complex, dimension(nfrq, lrx, ntxe, max_cmp), intent(in) BFD,
complex, dimension(nfrq, lrx, ntxe, max_cmp), intent(in) BFD_SCAT )

```

Here is the call graph for this function:



Here is the caller graph for this function:

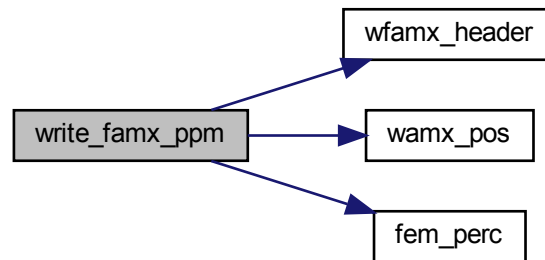


4.1.1.115 write_famx_ppm()

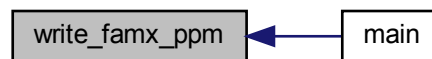
```

subroutine write_famx_ppm (
    character (len = 120), intent(in) TITLE,
    integer, intent(in) STEP,
    integer, intent(in) OUTPUT,
    integer, intent(in) SOURCE_TYPE,
    integer, intent(in) SURVEY_TYPE,
    integer, intent(in) NFRQ,
    real, dimension(nfrq), intent(in) FREQ,
    integer, intent(in) NTXE,
    integer, intent(in) MXVRTX,
    real, dimension(mxvrtx, ntxe), intent(in) SXE,
    real, dimension(mxvrtx, ntxe), intent(in) SXN,
    real, dimension(mxvrtx, ntxe), intent(in) SXZ,
    real, dimension(ntxe), intent(in) SXDIP,
    real, dimension(ntxe), intent(in) SXAZ,
    real, dimension(ntxe), intent(in) SXMNT,
    integer, intent(in) NRXG,
    integer, dimension(nrxg), intent(in) NCMPG,
    integer, dimension(10, nrxg), intent(in) PRTCMP,
    integer, intent(in) LRX,
    integer, intent(in) MRX,
    integer, intent(in) MQVR,
    real (kind = dp), dimension(mrx, nrxg, mqvr), intent(in) RXED,
    real (kind = dp), dimension(mrx, nrxg, mqvr), intent(in) RXND,
    real (kind = dp), dimension(mrx, nrxg, mqvr), intent(in) RXZD,
    real, dimension(mrx, nrxg), intent(in) RXDIP,
    real, dimension(mrx, nrxg), intent(in) RXAZ,
    real, dimension(mrx, nrxg), intent(in) RXMNT,
    complex, dimension(nfrq, lrx, ntxe, max_cmp), intent(in) BFD,
    complex, dimension(nfrq, lrx, ntxe, max_cmp), intent(in) BFD_SCAT,
    real, dimension(max_cmp, max_cmp - 1), intent(in) DXPRM,
    real, dimension(nfrq), intent(in) CURNT,
    integer, intent(in) CMPDX )
  
```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.116 write_fd()

```

subroutine write_fd (
    integer NW,
    integer PRFL,
    integer STEP,
    integer NFRQ,
    real, dimension(nfrq) FREQ,
    integer SURVEY_TYPE,
    integer SOURCE_TYPE,
    integer NTXE,
    real, dimension(ntaxe) SXMNT,
    integer NRXG,
    integer, dimension(ntaxe) NRGTX,
    integer, dimension(nrxg,ntaxe) RGTXID,
    integer LRX,
    integer MRX,
    integer, dimension(nrxg) NRX,
    integer, dimension(nrxg) UNITS,
    integer, dimension(nrxg) RX_TYPE,
    integer, dimension(nrxg) NCMPG,
    integer, dimension(10,nrxg) PRTCMP,

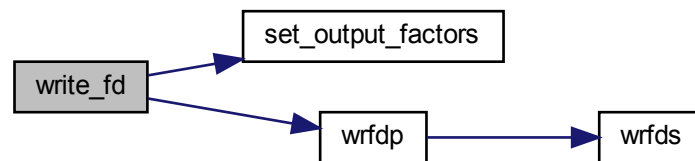
```

```

real, dimension(mrx,nrxg) RXMNT,
real(kind=8), dimension (mrx,nrxg,mqvr) RXED,
real(kind=8), dimension (mrx,nrxg,mqvr) RXND,
real(kind=8), dimension (mrx,nrxg,mqvr) RXZD,
integer MQVR,
logical PRTSEC,
character(len=120) TITLE,
complex, dimension(nfrq,lrx,ntxe,3) BFD,
complex, dimension(nfrq,lrx,ntxe,3) BFD_SCAT )

```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.117 write_fd_ppm()

```

subroutine write_fd_ppm (
    integer NW,
    integer NFRQ,
    real, dimension(nfrq) FREQ,
    integer NTXE,
    integer CMPDX,
    real(kind=8), dimension (1,ntxe,1) RXED,
    real(kind=8), dimension (1,ntxe,1) RXND,
    real(kind=8), dimension (1,ntxe,1) RXZD,
    character(len=120) TITLE,
    complex, dimension(nfrq,1,ntxe,3) BFD,
    real, dimension(nfrq) CURNT,
    real, dimension(3,3) DXPRM )

```

Here is the caller graph for this function:

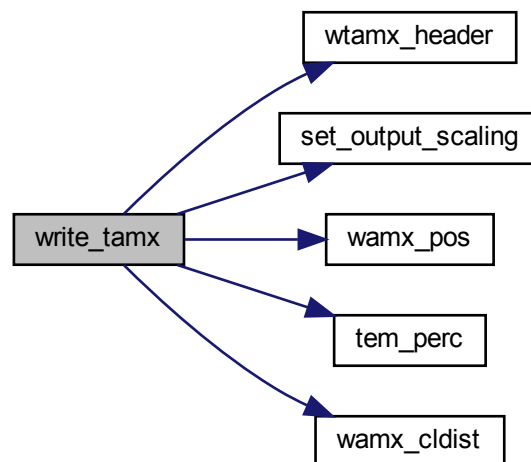


4.1.1.118 write_tamx()

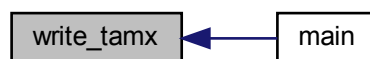
```

subroutine write_tamx (
    character (len = 120), intent(in) TITLE,
    integer, intent(in) STEP,
    integer, intent(in) OUTPUT,
    integer, intent(in) SOURCE_TYPE,
    integer, intent(in) SURVEY_TYPE,
    integer, intent(in) NCHNL,
    real, dimension(nchnl), intent(in) TMS,
    integer, intent(in) NTXE,
    integer, intent(in) MXVRTX,
    integer, dimension(ntaxe), intent(in) N_VRTX,
    real, dimension(mxvrtx,ntaxe), intent(in) SXE,
    real, dimension(mxvrtx,ntaxe), intent(in) SXN,
    real, dimension(mxvrtx,ntaxe), intent(in) SXZ,
    real, dimension(ntaxe), intent(in) SXDIP,
    real, dimension(ntaxe), intent(in) SXAZ,
    real, dimension(ntaxe), intent(in) SXMNT,
    integer, dimension(ntaxe), intent(in) NRGTX,
    integer, intent(in) NRXG,
    integer, dimension(nrxg,ntaxe), intent(in) RGTXID,
    integer, dimension(nrxg), intent(in) NCMPG,
    integer, dimension(10, nrxg), intent(in) PRTCMP,
    integer, intent(in) LRX,
    integer, intent(in) MRX,
    integer, dimension(nrxg), intent(in) NRX,
    integer, intent(in) MQVR,
    integer, dimension(nrxg), intent(in) RX_TYPE,
    integer, dimension(nrxg), intent(in) UNITS,
    real (kind = dp), dimension(mrx, nrxg, mqvr), intent(in) RXED,
    real (kind = dp), dimension(mrx, nrxg, mqvr), intent(in) RXND,
    real (kind = dp), dimension(mrx, nrxg, mqvr), intent(in) RXZD,
    real, dimension(mrx, nrxg), intent(in) RXDIP,
    real, dimension(mrx, nrxg), intent(in) RXAZ,
    real, dimension(mrx, nrxg), intent(in) RXMNT,
    real (kind = dp), dimension(max_cmp,ntaxe), intent(in) CLCD,
    real, dimension(nchnl, lrx,ntaxe, max_cmp), intent(in) BTD,
    real, dimension(nchnl, lrx,ntaxe, max_cmp), intent(in) BTD_SCAT )
  
```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.119 write_td()

```

subroutine write_td (
    integer NW,
    integer PRFL,
    integer STEP,
    integer NCHNL,
    real, dimension(nchnl) TMS,
    integer SURVEY_TYPE,
    integer SOURCE_TYPE,
    integer NTXE,
    real, dimension(ntaxe) SXMNT,
    integer NRXG,
    integer, dimension(ntaxe) NRGTX,
    integer, dimension(nrxg,ntaxe) RGTXID,

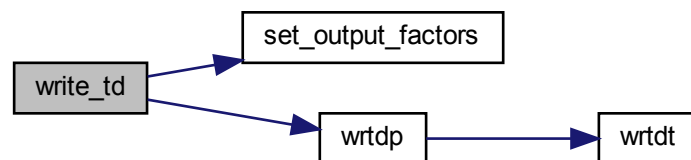
```

```

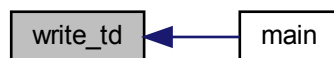
integer, dimension(nrxg) NRX,
integer LRX,
integer MRX,
integer, dimension(nrxg) UNITS,
integer, dimension(nrxg) RX_TYPE,
integer, dimension(nrxg) NCMPG,
integer, dimension(10,nrxg) PRTCMP,
real, dimension(mrx,nrxg) RXMNT,
real(kind=8), dimension (mrx,nrxg,mqvr) RXED,
real(kind=8), dimension (mrx,nrxg,mqvr) RXND,
real(kind=8), dimension (mrx,nrxg,mqvr) RXZD,
integer MQVR,
real(kind=8), dimension(3,ntxe) CLCD,
logical PRTSEC,
character(len=120) TITLE,
real, dimension(nchnl,lrx,ntxe,3) BTD,
real, dimension(nchnl,lrx,ntxe,3) BTD_SCAT )

```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.120 wrtdp()

```

subroutine wrtdp (
    integer NW,
    integer PRFL,
    integer PRTYP,
    integer NCHNL,

```



```

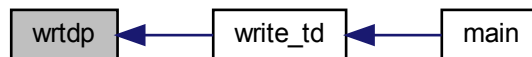
real, dimension(nchnl) TMS,
integer NLOC,
integer NRX1,
integer JC,
real(kind=8), dimension(3,nloc) RXPLT,
real, dimension(nchnl,nloc) YTR )

```

Here is the call graph for this function:



Here is the caller graph for this function:



4.1.1.121 wrtdt()

```

subroutine wrtdt (
    integer NW,
    integer PRTYP,
    integer NCHNL,
    real, dimension(nchnl) TMS,
    integer NLOC,
    integer NRX1,
    integer JC,
    real(kind=8), dimension(3,nloc) RXPLT,
    real, dimension(nchnl,nloc) YTR )

```

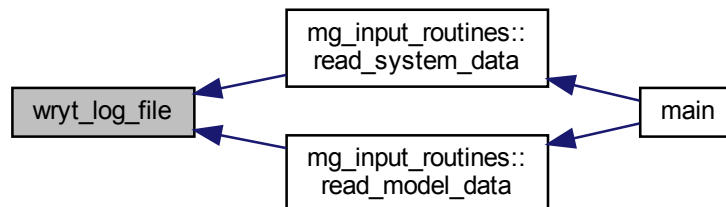
Here is the caller graph for this function:



4.1.1.122 `wryt_log_file()`

```
subroutine wryt_log_file (  
    integer NLG,  
    integer MSG,  
    integer MXERR,  
    integer ERR_LVL )
```

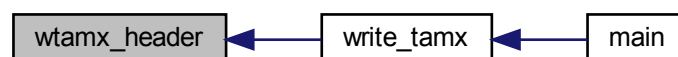
Here is the caller graph for this function:



4.1.1.123 `wtamx_header()`

```
subroutine wtamx_header (  
    integer, intent(in) NA,  
    integer, intent(in) OUTPUT,  
    integer, intent(in) NOUT )
```

Here is the caller graph for this function:



4.1.1.124 z_zp_lvls()

```

subroutine z_zp_lvls (
    integer, intent(in) NW,
    integer, intent(in) MZGRID,
    integer, intent(in) CS_TYPE,
    integer, intent(in) NTXE,
    integer, dimension(m_rx,ntxe), intent(in) N_SUB_RX,
    integer, intent(in) M_RX,
    integer, intent(in) SUB_RX_MAX,
    integer, dimension(ntxe), intent(in) N_RX,
    integer, intent(in) NCRD,
    real, dimension(ncrd,ntxe) TX_CRDZ,
    real, dimension(sub_rx_max,m_rx,ntxe), intent(in) RX_Z,
    integer, intent(in) WIRE_PATH,
    real, intent(in) DMIN,
    integer, intent(in) NZSRMAX,
    integer, intent(out) NZSR,
    real, dimension(2,mzgrid), intent(out) ZSRG,
    integer, intent(out) NZOB,
    real, dimension(mzgrid), intent(out) ZOBG )

```

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