gm3d

1.0

Generated by Doxygen 1.8.15

Chapter 1

Hierarchical Index

1.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

Chapter 2

Data Structure Index

2.1 Data Structures

Here are the data structures with brief descriptions:

Chapter 3

File Index

3.1 File List

Here is a list of all files with brief descriptions:

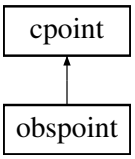
Chapter 4

Data Structure Documentation

4.1 cpoint Struct Reference

`#include <head_func.h>`

Inheritance diagram for cpoint:



Data Fields

- int id = -1
- double x = BDL_MAX
- double y = BDL_MAX
- double z = BDL_MAX

4.1.1 Field Documentation

4.1.1.1 id

`int cpoint::id = -1`

4.1.1.2 x

`double cpoint::x = BDL_MAX`

4.1.1.3 y

```
double cpoint::y = BDL_MAX
```

4.1.1.4 z

```
double cpoint::z = BDL_MAX
```

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

- /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/head_func.h

4.2 cube Struct Reference

```
#include <head_func.h>
```

Data Fields

- cpoint cen
- int ids [8] = {-1,-1,-1,-1,-1,-1,-1,-1}
- double dx = BDL_MAX
- double dy = BDL_MAX
- double dz = BDL_MAX

4.2.1 Field Documentation

4.2.1.1 cen

```
cpoint cube::cen
```

4.2.1.2 dx

```
double cube::dx = BDL_MAX
```

4.2.1.3 dy

```
double cube::dy = BDL_MAX
```

4.2.1.4 dz

```
double cube::dz = BDL_MAX
```

4.2.1.5 ids

```
int cube::ids[8] = {-1,-1,-1,-1,-1,-1,-1,-1}
```

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

- /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/head_func.h

4.3 DispHelp Class Reference

```
#include <disp_help.h>
```

Public Member Functions

- DispHelp ()
- ~DispHelp ()
- void addHeadInfo (string, string, string, string)
- void addUsage (string)
- void addOption (string, string, string)
- void addOptionSec (string, int)
- void addExample (string)
- void changeLayerOut (int, int)
- void show ()

Private Attributes

- string ex_name
- string version
- string descript
- string author
- int front_space
- int back_space
- opArray options
- strArray examples
- strArray usages

4.3.1 Constructor & Destructor Documentation

4.3.1.1 DispHelp()

```
DispHelp::DispHelp ( )  [inline]
```

4.3.1.2 ~DispHelp()

```
DispHelp::~DispHelp ( )  [inline]
```

4.3.2 Member Function Documentation

4.3.2.1 addExample()

```
void DispHelp::addExample (
             string ex )
```

4.3.2.2 addHeadInfo()

```
void DispHelp::addHeadInfo (
             string s1,
             string s2,
             string s3,
             string s4 )
```

4.3.2.3 addOption()

```
void DispHelp::addOption (
             string msg,
             string sflag,
             string lflag = "" )
```

4.3.2.4 addOptionSec()

```
void DispHelp::addOptionSec (
             string msg,
             int index = -1 )
```

4.3.2.5 addUsage()

```
void DispHelp::addUsage (
             string usg )
```

4.3.2.6 changeLayerOut()

```
void DispHelp::changeLayerOut (
             int left,
             int right )
```

4.3.2.7 show()

```
void DispHelp::show ( )
```

4.3.3 Field Documentation

4.3.3.1 author

```
string DispHelp::author  [private]
```

4.3.3.2 back_space

```
int DispHelp::back_space  [private]
```

4.3.3.3 descript

```
string DispHelp::descript  [private]
```

4.3.3.4 ex_name

```
string DispHelp::ex_name  [private]
```

4.3.3.5 examples

```
strArray DispHelp::examples  [private]
```

4.3.3.6 front_space

```
int DispHelp::front_space  [private]
```

4.3.3.7 options

```
opArray DispHelp::options  [private]
```

4.3.3.8 usages

```
strArray DispHelp::usages  [private]
```

4.3.3.9 version

```
string DispHelp::version  [private]
```

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

- /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/disp_help.h
- /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/disp_help.cpp

4.4 GM3D Class Reference

`#include <gm3d.h>`

Public Member Functions

- GM3D ()
- ~GM3D ()
- int BuildRegularGrid (char *)
- int AddModels (char *)
- int AddRegularBlock (modelist)
- int AddTiltedBlock (modelist)
- int AddSphereBlock (modelist)
- int AddInterfaceBlock (modelist)
- int ReadModel (char *, char *)
- int RegisteredOuput (bool)
- int OutMshFile (char *, string)
- int OutNeighborFile (char *, char *)
- int InitObs (char *)
- int OutObs (char *)
- int ForwardVz (char *)
- int ForwardVzx (char *)
- int ForwardVzy (char *)
- int ForwardVzz (char *)
- int ForwardDeltaT (char *, char *)
- int ForwardDeltaTx (char *, char *)
- int ForwardDeltaTy (char *, char *)
- int ForwardDeltaTz (char *, char *)
- int ForwardHax (char *, char *)
- int ForwardHay (char *, char *)
- int ForwardZa (char *, char *)

Private Attributes

- int obs_num_
- int model_num_
- int vert_num_
- obspointArray obs_p_
- _2dArray input_models_
- _1sArray input_model_names_
- _1dArray forward_model_
- cubeArray model_cube_
- cpointArray model_vert_
- _1dArray model_block_val_
- modelistArray model_list_
- _1iArray out_ele_ids_
- _1iArray out_ele_data_ids_
- _1iArray out_vert_ids_
- _int2intMap vert_out_map_
- _int2intMap ele_data_out_map_
- _2iArray model_vert_neighbor_
- _2iArray model_cube_neighbor_

4.4.1 Constructor & Destructor Documentation

4.4.1.1 GM3D()

```
GM3D::GM3D ( )  [inline]
```

4.4.1.2 ~GM3D()

```
GM3D::~GM3D ( )  [inline]
```

4.4.2 Member Function Documentation

4.4.2.1 AddInterfaceBlock()

```
int GM3D::AddInterfaceBlock (
            modelist para_list )
```

4.4.2.2 AddModels()

```
int GM3D::AddModels (
            char * filename )
```

4.4.2.3 AddRegularBlock()

```
int GM3D::AddRegularBlock (
            modelist para_list )
```

4.4.2.4 AddSphereBlock()

```
int GM3D::AddSphereBlock (
            modelist para_list )
```

4.4.2.5 AddTiltedBlock()

```
int GM3D::AddTiltedBlock (
            modelist para_list )
```

4.4.2.6 BuildRegularGrid()

```
int GM3D::BuildRegularGrid (
            char * space_para )
```

4.4.2.7 ForwardDeltaT()

```
int GM3D::ForwardDeltaT (
            char * noise_level,
            char * mag_para )
```

4.4.2.8 ForwardDeltaTx()

```
int GM3D::ForwardDeltaTx (
            char * noise_level,
            char * mag_para )
```

4.4.2.9 ForwardDeltaTy()

```
int GM3D::ForwardDeltaTy (
            char * noise_level,
            char * mag_para )
```

4.4.2.10 ForwardDeltaTz()

```
int GM3D::ForwardDeltaTz (
            char * noise_level,
            char * mag_para )
```

4.4.2.11 ForwardHax()

```
int GM3D::ForwardHax (
            char * noise_level,
            char * mag_para )
```

4.4.2.12 ForwardHay()

```
int GM3D::ForwardHay (
            char * noise_level,
            char * mag_para )
```

4.4.2.13 ForwardVz()

```
int GM3D::ForwardVz (
            char * noise_level )
```

4.4.2.14 ForwardVzx()

```
int GM3D::ForwardVzx (
            char * noise_level )
```

4.4.2.15 ForwardVzy()

```
int GM3D::ForwardVzy (
            char * noise_level )
```

4.4.2.16 ForwardVzz()

```
int GM3D::ForwardVzz (
            char * noise_level )
```

4.4.2.17 ForwardZa()

```
int GM3D::ForwardZa (
            char * noise_level,
            char * mag_para )
```

4.4.2.18 InitObs()

```
int GM3D::InitObs (
            char * obs_para )
```

4.4.2.19 OutMshFile()

```
int GM3D::OutMshFile (
            char * filename,
            string data_name )
```

4.4.2.20 OutNeighborFile()

```
int GM3D::OutNeighborFile (
            char * v_name,
            char * b_name )
```

4.4.2.21 OutObs()

```
int GM3D::OutObs (
            char * filename )
```

4.4.2.22 ReadModel()

```
int GM3D::ReadModel (
            char * filename,
            char * input_forward_model_name )
```

4.4.2.23 RegisteredOuput()

```
int GM3D::RegisteredOuput (
            bool remove_empty_element )
```

4.4.3 Field Documentation

4.4.3.1 ele_data_out_map_

```
_int2intMap GM3D::ele_data_out_map_  [private]
```

4.4.3.2 forward_model_

```
_1dArray GM3D::forward_model_  [private]
```

4.4.3.3 input_model_names_

```
_1sArray GM3D::input_model_names_  [private]
```

4.4.3.4 input_models_

```
_2dArray GM3D::input_models_  [private]
```

4.4.3.5 model_block_val_

```
_1dArray GM3D::model_block_val_  [private]
```

4.4.3.6 model_cube_

```
cubeArray GM3D::model_cube_  [private]
```

4.4.3.7 model_cube_neighbor_

_2iArray GM3D::model_cube_neighbor_ [private]

4.4.3.8 model_list_

modelistArray GM3D::model_list_ [private]

4.4.3.9 model_num_

int GM3D::model_num_ [private]

4.4.3.10 model_vert_

cpointArray GM3D::model_vert_ [private]

4.4.3.11 model_vert_neighbor_

_2iArray GM3D::model_vert_neighbor_ [private]

4.4.3.12 obs_num_

int GM3D::obs_num_ [private]

4.4.3.13 obs_p_

obspointArray GM3D::obs_p_ [private]

4.4.3.14 out_ele_data_ids_

_1iArray GM3D::out_ele_data_ids_ [private]

4.4.3.15 out_ele_ids_

```
_liArray GM3D::out_ele_ids_  [private]
```

4.4.3.16 out_vert_ids_

```
_liArray GM3D::out_vert_ids_  [private]
```

4.4.3.17 vert_num_

```
int GM3D::vert_num_  [private]
```

4.4.3.18 vert_out_map_

```
_int2intMap GM3D::vert_out_map_  [private]
```

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

- /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/gm3d.h
- /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/add_interface_block.cpp
- /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/add_models.cpp
- /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/add_regular_block.cpp
- /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/add_sphere_block.cpp
- /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/add_tilted_block.cpp
- /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/build_regular_grid.cpp
- /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/forward_delta_t.cpp
- /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/forward_delta_tx.cpp
- /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/forward_delta_ty.cpp
- /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/forward_delta_tz.cpp
- /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/forward_hax.cpp
- /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/forward_hay.cpp
- /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/forward_vz.cpp
- /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/forward_vzx.cpp
- /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/forward_vzy.cpp
- /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/forward_vzz.cpp
- /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/forward_za.cpp
- /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/init_obs.cpp
- /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/out_msh_file.cpp
- /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/out_neighbor_file.cpp
- /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/out_obs.cpp
- /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/read_model.cpp
- /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/registered_output.cpp

4.5 modelist Struct Reference

`#include <head_func.h>`

Data Fields

- char mod_type [1024]
- char val_type [1024]
- char mod_para [1024]
- double mod_value

4.5.1 Field Documentation

4.5.1.1 mod_para

`char modelist::mod_para[1024]`

4.5.1.2 mod_type

`char modelist::mod_type[1024]`

4.5.1.3 mod_value

`double modelist::mod_value`

4.5.1.4 val_type

`char modelist::val_type[1024]`

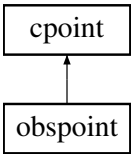
The documentation for this struct was generated from the following file:

- /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/head_func.h

4.6 obspoint Struct Reference

`#include <head_func.h>`

Inheritance diagram for obspoint:



Data Fields

- double val = BDL_MAX
- double dev = BDL_MAX

4.6.1 Field Documentation

4.6.1.1 dev

`double obspoint::dev = BDL_MAX`

4.6.1.2 val

`double obspoint::val = BDL_MAX`

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

- /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/head_func.h

4.7 option Struct Reference

`#include <disp_help.h>`

Public Member Functions

- option ()

Data Fields

- string flag_s
- string flag_l
- string message
- strArray sec_message

4.7.1 Constructor & Destructor Documentation

4.7.1.1 option()

```
option::option ( )  [inline]
```

4.7.2 Field Documentation

4.7.2.1 flag_l

```
string option::flag_l
```

4.7.2.2 flag_s

```
string option::flag_s
```

4.7.2.3 message

```
string option::message
```

4.7.2.4 sec_message

```
strArray option::sec_message
```

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

- /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/disp_help.h

4.8 ProgressBar Class Reference

`#include <progress_bar.h>`

Public Member Functions

- ProgressBar ()
- ProgressBar (unsigned long n_, const char ∗description_="", std::ostream &out_=std::cerr)
- void SetFrequencyUpdate (unsigned long frequency_update_)
- void SetStyle (const char ∗unit_bar_, const char ∗unit_space_)
- void Progressed (unsigned long idx_)

Private Member Functions

- void ClearBarField ()
- int GetConsoleWidth ()
- int GetBarLength ()

Private Attributes

- unsigned long n
- unsigned int desc_width
- unsigned long frequency_update
- std::ostream ∗ out
- const char ∗ description
- const char ∗ unit_bar
- const char ∗ unit_space

4.8.1 Constructor & Destructor Documentation

4.8.1.1 ProgressBar() [1/2]

```
ProgressBar::ProgressBar ( )
```

4.8.1.2 ProgressBar() [2/2]

```
ProgressBar::ProgressBar (
            unsigned long n_,
            const char * description_ = "",
            std::ostream & out_ = std::cerr )
```

4.8.2 Member Function Documentation

4.8.2.1 ClearBarField()

```
void ProgressBar::ClearBarField ( )  [private]
```

4.8.2.2 GetBarLength()

```
int ProgressBar::GetBarLength ( )  [private]
```

4.8.2.3 GetConsoleWidth()

```
int ProgressBar::GetConsoleWidth ( )  [private]
```

4.8.2.4 Progressed()

```
void ProgressBar::Progressed (
            unsigned long idx_ )
```

4.8.2.5 SetFrequencyUpdate()

```
void ProgressBar::SetFrequencyUpdate (
            unsigned long frequency_update_ )
```

4.8.2.6 SetStyle()

```
void ProgressBar::SetStyle (
            const char * unit_bar_,
            const char * unit_space_ )
```

4.8.3 Field Documentation

4.8.3.1 desc_width

```
unsigned int ProgressBar::desc_width  [private]
```

4.8.3.2 description

```
const char* ProgressBar::description  [private]
```

4.8.3.3 frequency_update

```
unsigned long ProgressBar::frequency_update  [private]
```

4.8.3.4 n

```
unsigned long ProgressBar::n  [private]
```

4.8.3.5 out

```
std::ostream* ProgressBar::out  [private]
```

4.8.3.6 unit_bar

```
const char* ProgressBar::unit_bar  [private]
```

4.8.3.7 unit_space

```
const char* ProgressBar::unit_space  [private]
```

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

- /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/progress_bar.h
- /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/progress_bar.cpp

Chapter 5

File Documentation

5.1 /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/add_interface_block.cpp File Reference

```
#include "gm3d.h"
```

5.2 /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/add_models.cpp File Reference

```
#include "gm3d.h"
```

5.3 /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/add_regular_block.cpp File Reference

```
#include "gm3d.h"
```

5.4 /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/add_sphere_block.cpp File Reference

```
#include "gm3d.h"
```

5.5 /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/add_tilted_block.cpp File Reference

```
#include "gm3d.h"
```

5.6 /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/build_regular_grid.cpp File Reference

```
#include "gm3d.h"
```

5.7 /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/disp_help.cpp File Reference

```
#include "disp_help.h"
```

5.8 /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/disp_help.h File Reference

```
#include <iostream>
#include <sstream>
#include <fstream>
#include <string.h>
#include <stdlib.h>
#include <stdio.h>
#include <unistd.h>
#include <iomanip>
#include <sys/ioctl.h>
#include "vector"
```

Data Structures

- struct option
- class DispHelp

Typedefs

- typedef vector< string > strArray
- typedef vector< option > opArray

5.8.1 Typedef Documentation

5.8.1.1 opArray

```
typedef vector<option> opArray
```

5.8.1.2 strArray

```
typedef vector<string> strArray
```

5.9 /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/forward_delta_t.cpp File Reference

```
#include "gm3d.h"
```

5.10 /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/forward_delta_tx.cpp File Reference

```
#include "gm3d.h"
```

5.11 /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/forward_delta_ty.cpp File Reference

```
#include "gm3d.h"
```

5.12 /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/forward_delta_tz.cpp File Reference

```
#include "gm3d.h"
```

5.13 /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/forward_hax.cpp File Reference

```
#include "gm3d.h"
```

5.14 /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/forward_hay.cpp File Reference

```
#include "gm3d.h"
```

5.15 /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/forward_vz.cpp File Reference

```
#include "gm3d.h"
```

5.16 /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/forward_vzx.cpp File Reference

```
#include "gm3d.h"
```

5.17 /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/forward_vzy.cpp File Reference

```
#include "gm3d.h"
```

5.18 /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/forward_vzz.cpp File Reference

```
#include "gm3d.h"
```

5.19 /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/forward_za.cpp File Reference

```
#include "gm3d.h"
```

5.20 /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/gm3d.h File Reference

```
#include "head_func.h"
#include "progress_bar.h"
```

Data Structures

- class GM3D

5.21 /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/head_func.cpp File Reference

```
#include "head_func.h"
```

Functions

- cpoint operator - (cpoint a, cpoint b)
- double modCpoint (cpoint v)
- double arctg (double v)
- stringstream str2ss (string s)
- string cpoint_id (cpoint c)
- int open_infile (ifstream &infile, char *filename)
- int open_outfile (ofstream &outfile, char *filename)
- double grid_interpolate (double x0, double y0, double dx, double dy, double x, double y, double d0, double d1, double d2, double d3)

5.21.1 Function Documentation

5.21.1.1 arctg()

```
double arctg (
            double v )
```

5.21.1.2 cpoint_id()

```
string cpoint_id (
            cpoint c )
```

5.21.1.3 grid_interpolate()

```
double grid_interpolate (
            double x0,
            double y0,
            double dx,
            double dy,
            double x,
            double y,
            double d0,
            double d1,
            double d2,
            double d3 )
```

5.21.1.4 modCpoint()

```
double modCpoint (
            cpoint v )
```

5.21.1.5 open_infile()

```
int open_infile (
            ifstream & infile,
            char * filename )
```

5.21.1.6 open_outfile()

```
int open_outfile (
            ofstream & outfile,
            char * filename )
```

5.21.1.7 operator -()

```
cpoint operator - (
            cpoint a,
            cpoint b )
```

5.21.1.8 str2ss()

```
stringstream str2ss (
            string s )
```

5.22 /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/head_func.h File Reference

```
#include "iostream"
#include "fstream"
#include "sstream"
#include "string.h"
#include "cmath"
#include "iomanip"
#include "stdio.h"
#include "stdlib.h"
#include "unistd.h"
#include "vector"
#include "map"
#include "algorithm"
#include "ctime"
#include "omp.h"
#include "random"
```

Data Structures

- struct modelist
- struct cpoint
- struct obspoint
- struct cube

Macros

- #define BDL_MAX 1e+30
- #define BDL_MIN -1e+30
- #define PRECISION 16
- #define ZERO 1e-16
- #define Pi (4.0∗atan(1.0))
- #define G0 6.67408e-3
- #define T0 5.0e+4
- #define MAX(a, b) (a>b?a:b)
- #define MIN(a, b) (a<b?a:b)
- #define SetToBox(a, b, in) (MAX(a,MIN(b,in)))
- #define BOLDRED "\033[1m\033[31m"
- #define BOLDGREEN "\033[1m\033[32m"
- #define BOLDYELLOW "\033[1m\033[33m"
- #define BOLDBLUE "\033[1m\033[34m"
- #define UNDERLINE "\033[1m\033[4m"
- #define RESET "\033[0m"
- #define MOVEUP(x) printf("\033[%dA", (x))
- #define MOVEDOWN(x) printf("\033[%dB", (x))
- #define MOVELEFT(x) printf("\033[%dD", (x))
- #define MOVERIGHT(x) printf("\033[%dC", (x))
- #define MOVETO(y, x) printf("\033[%d;%dH", (y), (x))
- #define CLEARLINE "\033[K"
- #define CLEARALL "\033[2J"

Typedefs

- typedef vector< int > _1iArray
- typedef vector< double > _1dArray
- typedef vector< string > _1sArray
- typedef vector< vector< int > > _2iArray
- typedef vector< vector< double > > _2dArray
- typedef map< int, int > _int2intMap
- typedef vector< modelist > modelistArray
- typedef vector< cpoint > cpointArray
- typedef map< string, cpoint > _str2pointMap
- typedef vector< obspoint > obspointArray
- typedef vector< cube > cubeArray

Functions

- cpoint operator - (cpoint, cpoint)
- double modCpoint (cpoint)
- double arctg (double)
- stringstream str2ss (string)
- string cpoint_id (cpoint)
- int open_infile (ifstream &, char *)
- int open_outfile (ofstream &, char *)
- double grid_interpolate (double, double, double, double, double, double, double, double, double, double)

5.22.1 Macro Definition Documentation

5.22.1.1 BDL_MAX

```
#define BDL_MAX 1e+30
```

5.22.1.2 BDL_MIN

```
#define BDL_MIN -1e+30
```

5.22.1.3 BOLDBLUE

```
#define BOLDBLUE "\033[1m\033[34m"
```

5.22.1.4 BOLDGREEN

```
#define BOLDGREEN "\033[1m\033[32m"
```

5.22.1.5 BOLDRED

```
#define BOLDRED "\033[1m\033[31m"
```

5.22.1.6 BOLDYELLOW

```
#define BOLDYELLOW "\033[1m\033[33m"
```

5.22.1.7 CLEARALL

```
#define CLEARALL "\033[2J"
```

5.22.1.8 CLEARLINE

```
#define CLEARLINE "\033[K"
```

5.22.1.9 G0

```
#define G0 6.67408e-3
```

5.22.1.10 MAX

```
#define MAX(
              a,
              b ) (a>b?a:b)
```

5.22.1.11 MIN

```
#define MIN(
              a,
              b ) (a<b?a:b)
```

5.22.1.12 MOVEDOWN

```
#define MOVEDOWN(
              x ) printf("\033[%dB", (x))
```

5.22.1.13 MOVELEFT

```
#define MOVELEFT(
              x ) printf("\033[%dD", (x))
```

5.22.1.14 MOVERIGHT

```
#define MOVERIGHT(
              x ) printf("\033[%dC", (x))
```

5.22.1.15 MOVETO

```
#define MOVETO(
              y,
              x ) printf("\033[%d;%dH", (y), (x))
```

5.22.1.16 MOVEUP

```
#define MOVEUP(
              x ) printf("\033[%dA", (x))
```

5.22.1.17 Pi

```
#define Pi (4.0*atan(1.0))
```

5.22.1.18 PRECISION

```
#define PRECISION 16
```

5.22.1.19 RESET

```
#define RESET "\033[0m"
```

5.22.1.20 SetToBox

```
#define SetToBox(
              a,
              b,
              in ) (MAX(a,MIN(b,in)))
```

5.22.1.21 T0

```
#define T0 5.0e+4
```

5.22.1.22 UNDERLINE

```
#define UNDERLINE "\033[1m\033[4m"
```

5.22.1.23 ZERO

```
#define ZERO 1e-16
```

5.22.2 Typedef Documentation

5.22.2.1 _1dArray

```
typedef vector<double> _1dArray
```

5.22.2.2 _1iArray

```
typedef vector<int> _1iArray
```

5.22.2.3 _1sArray

```
typedef vector<string> _1sArray
```

5.22.2.4 _2dArray

```
typedef vector<vector<double> > _2dArray
```

5.22.2.5 _2iArray

```
typedef vector<vector<int> > _2iArray
```

5.22.2.6 _int2intMap

```
typedef map<int,int> _int2intMap
```

5.22.2.7 _str2pointMap

```
typedef map<string,cpoint> _str2pointMap
```

5.22.2.8 cpointArray

```
typedef vector<cpoint> cpointArray
```

5.22.2.9 cubeArray

```
typedef vector<cube> cubeArray
```

5.22.2.10 modelistArray

```
typedef vector<modelist> modelistArray
```

5.22.2.11 obspointArray

```
typedef vector<obspoint> obspointArray
```

5.22.3 Function Documentation

5.22.3.1 arctg()

```
double arctg (
            double  )
```

5.22.3.2 cpoint_id()

```
string cpoint_id (
            cpoint  )
```

5.22.3.3 grid_interpolate()

```
double grid_interpolate (
            double ,
            double ,
            double ,
            double ,
            double ,
            double ,
            double ,
            double ,
            double ,
            double  )
```

5.22.3.4 modCpoint()

```
double modCpoint (
            cpoint  )
```

5.22.3.5 open_infile()

```
int open_infile (
            ifstream & ,
            char *  )
```

5.22.3.6 open_outfile()

```
int open_outfile (
             ofstream & ,
             char *  )
```

5.22.3.7 operator -()

```
cpoint operator - (
             cpoint ,
             cpoint  )
```

5.22.3.8 str2ss()

```
stringstream str2ss (
             string  )
```

5.23 /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/init_obs.cpp File Reference

```
#include "gm3d.h"
```

5.24 /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/main.cpp File Reference

```
#include "gm3d.h"
#include "disp_help.h"
```

Functions

- void display_help_info (char *program_name)
- int main (int argc, char *argv[ ])

5.24.1 Function Documentation

5.24.1.1 display_help_info()

```
void display_help_info (
            char * program_name )
```

5.24.1.2 main()

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

5.25 /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/out_msh_file.cpp File Reference

```
#include "gm3d.h"
```

5.26 /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/out_neighbor_file.cpp File Reference

```
#include "gm3d.h"
```

5.27 /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/out_obs.cpp File Reference

```
#include "gm3d.h"
```

5.28 /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/progress_bar.cpp File Reference

```
#include "progress_bar.h"
```

5.29 /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/progress_bar.h File Reference

```
#include <sys/ioctl.h>
#include <iostream>
#include <iomanip>
#include <cstring>
#include <thread>
#include <chrono>
```

Data Structures

- class ProgressBar

Macros

- #define TOTAL_PERCENTAGE 100.0
- #define CHARACTER_WIDTH_PERCENTAGE 4

5.29.1 Macro Definition Documentation

5.29.1.1 CHARACTER_WIDTH_PERCENTAGE

```
#define CHARACTER_WIDTH_PERCENTAGE 4
```

5.29.1.2 TOTAL_PERCENTAGE

```
#define TOTAL_PERCENTAGE 100.0
```

5.30 /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/read_model.cpp File Reference

```
#include "gm3d.h"
```

5.31 /Users/zhangyi/Documents/GitHub/Toolbox/gm3d/src/registered_output.cpp File Reference

```
#include "gm3d.h"
```

Index