

Disco2

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Chapter 1

File Index

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Chapter 2

File Documentation

2.1 src/Cell/cell_boundary.c File Reference

```
#include <stdlib.h>
#include <stdio.h>
#include <math.h>
#include "../Headers/Cell.h"
#include "../Headers/Grid.h"
#include "../Headers/Face.h"
#include "../Headers/GravMass.h"
#include "../Headers/MPIsetup.h"
#include "../Headers/header.h"
```

Macros

- #define [CELL_PRIVATE_DEFS](#)

Functions

- void [cell_boundary_outflow_r](#) (struct Cell ***theCells, struct Face *theFaces, struct Grid *theGrid, struct MPIsetup *theMPIsetup, int *nri)
- void [cell_boundary_outflow_z](#) (struct Cell ***theCells, struct Face *theFaces, struct Grid *theGrid, struct MPIsetup *theMPIsetup, int *nzk)
- void [cell_boundary_fixed_r](#) (struct Cell ***theCells, struct Grid *theGrid, struct MPIsetup *theMPIsetup)

2.1.1 Macro Definition Documentation

2.1.1.1 #define CELL_PRIVATE_DEFS

Definition at line 1 of file cell_boundary.c.

2.1.2 Function Documentation

2.1.2.1 void cell_boundary_fixed_r (struct Cell *** *theCells*, struct Grid * *theGrid*, struct MPIsetup * *theMPIsetup*)

Definition at line 162 of file cell_boundary.c.

2.1.2.2 void cell_boundary_outflow_r (struct Cell *** *theCells*, struct Face * *theFaces*, struct Grid * *theGrid*, struct MPIsetup * *theMPIsetup*, int * *nri*)

Definition at line 13 of file cell_boundary.c.

2.1.2.3 void cell_boundary_outflow_z (struct Cell *** *theCells*, struct Face * *theFaces*, struct Grid * *theGrid*, struct MPIsetup * *theMPIsetup*, int * *nz*)

Definition at line 91 of file cell_boundary.c.

2.2 src/Cell/cell_clear.c File Reference

```
#include <stdlib.h>
#include <stdio.h>
#include <math.h>
#include "../Headers/Cell.h"
#include "../Headers/Grid.h"
#include "../Headers/Face.h"
#include "../Headers/GravMass.h"
#include "../Headers/header.h"
```

Macros

- #define [CELL_PRIVATE_DEFS](#)

Functions

- void [cell_clear_w](#) (struct Cell ****theCells*, struct Grid **theGrid*)
- void [cell_clear_divB](#) (struct Cell ****theCells*, struct Grid **theGrid*)
- void [cell_clear_GradPsi](#) (struct Cell ****theCells*, struct Grid **theGrid*)

2.2.1 Macro Definition Documentation

2.2.1.1 #define CELL_PRIVATE_DEFS

Definition at line 1 of file cell_clear.c.

2.2.2 Function Documentation

2.2.2.1 void cell_clear_divB (struct Cell *** *theCells*, struct Grid * *theGrid*)

Definition at line 25 of file cell_clear.c.

2.2.2.2 void cell_clear_GradPsi (struct Cell *** *theCells*, struct Grid * *theGrid*)

Definition at line 38 of file cell_clear.c.

2.2.2.3 void cell_clear_w (struct Cell *** *theCells*, struct Grid * *theGrid*)

Definition at line 12 of file cell_clear.c.

2.3 src/Cell/cell_conversion.c File Reference

```
#include <stdlib.h>
#include <stdio.h>
#include <math.h>
#include "../Headers/Cell.h"
#include "../Headers/Grid.h"
#include "../Headers/Face.h"
#include "../Headers/GravMass.h"
#include "../Headers/header.h"
```

Macros

- `#define CELL_PRIVATE_DEFS`

Functions

- void `cell_prim2cons` (double *prim, double *cons, double r, double dV, double GAMMALAW)
- void `cell_calc_cons` (struct Cell ***theCells, struct Grid *theGrid)
- void `cell_cons2prim` (double *cons, double *prim, double r, double dV, struct Grid *theGrid)
- void `cell_calc_prim` (struct Cell ***theCells, struct Grid *theGrid)

2.3.1 Macro Definition Documentation

2.3.1.1 `#define CELL_PRIVATE_DEFS`

Definition at line 1 of file cell_conversion.c.

2.3.2 Function Documentation

2.3.2.1 void `cell_calc_cons` (struct Cell *** *theCells*, struct Grid * *theGrid*)

Definition at line 50 of file cell_conversion.c.

2.3.2.2 void `cell_calc_prim` (struct Cell *** *theCells*, struct Grid * *theGrid*)

Definition at line 181 of file cell_conversion.c.

2.3.2.3 void `cell_cons2prim` (double * *cons*, double * *prim*, double *r*, double *dV*, struct Grid * *theGrid*)

Definition at line 126 of file cell_conversion.c.

2.3.2.4 void `cell_prim2cons` (double * *prim*, double * *cons*, double *r*, double *dV*, double *GAMMALAW*)

Definition at line 12 of file cell_conversion.c.

2.4 src/Cell/cell_create_destroy.c File Reference

```
#include <stdlib.h>
#include <stdio.h>
#include <math.h>
#include "../Headers/Cell.h"
#include "../Headers/Grid.h"
#include "../Headers/Face.h"
#include "../Headers/GravMass.h"
#include "../Headers/MPIsetup.h"
#include "../Headers/header.h"
```

Macros

- `#define CELL_PRIVATE_DEFS`

Functions

- `struct Cell *** cell_create` (struct Grid *theGrid, struct MPIsetup *theMPIsetup)
- `void cell_destroy` (struct Cell ***theCells, struct Grid *theGrid)

2.4.1 Macro Definition Documentation

2.4.1.1 #define CELL_PRIVATE_DEFS

Definition at line 1 of file cell_create_destroy.c.

2.4.2 Function Documentation

2.4.2.1 struct Cell*** cell_create (struct Grid * *theGrid*, struct MPIsetup * *theMPIsetup*) [read]

Definition at line 12 of file cell_create_destroy.c.

2.4.2.2 void cell_destroy (struct Cell *** *theCells*, struct Grid * *theGrid*)

Definition at line 86 of file cell_create_destroy.c.

2.5 src/Cell/cell_flux_p.c File Reference

```
#include <stdlib.h>
#include <stdio.h>
#include <math.h>
#include "../Headers/Cell.h"
#include "../Headers/Riemann.h"
#include "../Headers/Grid.h"
#include "../Headers/Face.h"
#include "../Headers/GravMass.h"
#include "../Headers/header.h"
```

Macros

- #define [CELL_PRIVATE_DEFS](#)

Functions

- void [cell_flux_p](#) (struct Cell ***theCells, struct Grid *theGrid, double dt)

2.5.1 Macro Definition Documentation

2.5.1.1 #define CELL_PRIVATE_DEFS

Definition at line 1 of file cell_flux_p.c.

2.5.2 Function Documentation

2.5.2.1 void cell_flux_p (struct Cell *** *theCells*, struct Grid * *theGrid*, double *dt*)

Definition at line 12 of file cell_flux_p.c.

2.6 src/Cell/cell_init.c File Reference

```
#include <stdlib.h>
#include <stdio.h>
#include <math.h>
#include "../Headers/Cell.h"
#include "../Headers/Grid.h"
#include "../Headers/Face.h"
#include "../Headers/GravMass.h"
#include "../Headers/MPIsetup.h"
#include "../Headers/header.h"
```

Macros

- #define [CELL_PRIVATE_DEFS](#)

Functions

- void [cell_single_init](#) (struct Cell ***theCells, struct Grid *theGrid, int i, int j, int k)
- void [cell_init](#) (struct Cell ***theCells, struct Grid *theGrid, struct MPIsetup *theMPIsetup)

2.6.1 Macro Definition Documentation

2.6.1.1 #define CELL_PRIVATE_DEFS

Definition at line 1 of file cell_init.c.

2.6.2 Function Documentation

2.6.2.1 void cell_init (struct Cell *** *theCells*, struct Grid * *theGrid*, struct MPIsetup * *theMPIsetup*)

Definition at line 39 of file cell_init.c.

2.6.2.2 void cell_single_init (struct Cell *** *theCells*, struct Grid * *theGrid*, int *i*, int *j*, int *k*)

Definition at line 12 of file cell_init.c.

2.7 src/Cell/cell_mindt.c File Reference

```
#include <stdlib.h>
#include <stdio.h>
#include <math.h>
#include "../Headers/Cell.h"
#include "../Headers/Grid.h"
#include "../Headers/header.h"
```

Macros

- #define [CELL_PRIVATE_DEFS](#)

Functions

- double [maxvel](#) (double **prim*, double *w*, double *r*, struct Grid **theGrid*)
- double [cell_mindt](#) (struct Cell ****theCells*, struct Grid **theGrid*)

2.7.1 Macro Definition Documentation

2.7.1.1 #define CELL_PRIVATE_DEFS

Definition at line 1 of file cell_mindt.c.

2.7.2 Function Documentation

2.7.2.1 double cell_mindt (struct Cell *** *theCells*, struct Grid * *theGrid*)

Definition at line 33 of file cell_mindt.c.

2.7.2.2 double maxvel (double * *prim*, double *w*, double *r*, struct Grid * *theGrid*)

Definition at line 9 of file cell_mindt.c.

2.8 src/Cell/cell_misc.c File Reference

```
#include <stdlib.h>
#include <stdio.h>
#include <math.h>
#include "../Headers/Cell.h"
#include "../Headers/Grid.h"
#include "../Headers/Face.h"
#include "../Headers/GravMass.h"
#include "../Headers/header.h"
```

Macros

- #define [CELL_PRIVATE_DEFS](#)

Functions

- void [cell_clean_pi](#) (struct Cell ***theCells, struct Grid *theGrid)
- void [cell_copy](#) (struct Cell ***theCells, struct Grid *theGrid)
- void [cell_adjust_RK_cons](#) (struct Cell ***theCells, struct Grid *theGrid, double RK)
- void [cell_update_phi](#) (struct Cell ***theCells, struct Grid *theGrid, double RK, double dt)
- void [cell_update_dphi](#) (struct Cell ***theCells, struct Grid *theGrid)

2.8.1 Macro Definition Documentation

2.8.1.1 #define CELL_PRIVATE_DEFS

Definition at line 1 of file cell_misc.c.

2.8.2 Function Documentation

2.8.2.1 void cell_adjust_RK_cons (struct Cell *** *theCells*, struct Grid * *theGrid*, double *RK*)

Definition at line 47 of file cell_misc.c.

2.8.2.2 void cell_clean_pi (struct Cell *** *theCells*, struct Grid * *theGrid*)

Definition at line 12 of file cell_misc.c.

2.8.2.3 void cell_copy (struct Cell *** *theCells*, struct Grid * *theGrid*)

Definition at line 30 of file cell_misc.c.

2.8.2.4 void cell_update_dphi (struct Cell *** *theCells*, struct Grid * *theGrid*)

Definition at line 87 of file cell_misc.c.

2.8.2.5 void cell_update_phi (struct Cell *** *theCells*, struct Grid * *theGrid*, double *RK*, double *dt*)

Definition at line 65 of file cell_misc.c.

2.9 src/Cell/cell_modify_data.c File Reference

```
#include <stdlib.h>
#include <stdio.h>
#include <math.h>
#include "../Headers/Cell.h"
#include "../Headers/Grid.h"
#include "../Headers/Face.h"
#include "../Headers/GravMass.h"
#include "../Headers/header.h"
```

Macros

- `#define CELL_PRIVATE_DEFS`

Functions

- void `cell_add_cons` (struct Cell *oneCell, int q, double add)
- void `cell_add_divB` (struct Cell *oneCell, double add)
- void `cell_add_GradPsi` (struct Cell *oneCell, int i, double add)
- void `cell_add_wiph` (struct Cell *oneCell, double add)
- void `cell_mult_psi` (struct Cell *oneCell, double mult)
- void `cell_set_prim` (struct Cell ***theCells, int i, int j, int k, int q, double value)
- void `cell_set_tiph` (struct Cell ***theCells, int i, int j, int k, double value)

2.9.1 Macro Definition Documentation

2.9.1.1 `#define CELL_PRIVATE_DEFS`

Definition at line 1 of file cell_modify_data.c.

2.9.2 Function Documentation

2.9.2.1 void `cell_add_cons` (struct Cell * *oneCell*, int *q*, double *add*)

Definition at line 11 of file cell_modify_data.c.

2.9.2.2 void `cell_add_divB` (struct Cell * *oneCell*, double *add*)

Definition at line 14 of file cell_modify_data.c.

2.9.2.3 void `cell_add_GradPsi` (struct Cell * *oneCell*, int *i*, double *add*)

Definition at line 17 of file cell_modify_data.c.

2.9.2.4 void `cell_add_wiph` (struct Cell * *oneCell*, double *add*)

Definition at line 20 of file cell_modify_data.c.

2.9.2.5 void cell_mult_psi (struct Cell * *oneCell*, double *mult*)

Definition at line 23 of file cell_modify_data.c.

2.9.2.6 void cell_set_prim (struct Cell *** *theCells*, int *i*, int *j*, int *k*, int *q*, double *value*)

Definition at line 28 of file cell_modify_data.c.

2.9.2.7 void cell_set_tiph (struct Cell *** *theCells*, int *i*, int *j*, int *k*, double *value*)

Definition at line 31 of file cell_modify_data.c.

2.10 src/Cell/cell_plm.c File Reference

```
#include <stdlib.h>
#include <stdio.h>
#include <math.h>
#include "../Headers/Cell.h"
#include "../Headers/Grid.h"
#include "../Headers/Face.h"
#include "../Headers/GravMass.h"
#include "../Headers/header.h"
```

Macros

- #define [CELL_PRIVATE_DEFS](#)

Functions

- void [cell_plm_rz](#) (struct Cell ****theCells*, struct Grid **theGrid*, struct Face **theFaces*, int *Nf*, int *rz*)
- void [cell_plm_p](#) (struct Cell ****theCells*, struct Grid **theGrid*)

2.10.1 Macro Definition Documentation

2.10.1.1 #define CELL_PRIVATE_DEFS

Definition at line 1 of file cell_plm.c.

2.10.2 Function Documentation

2.10.2.1 void cell_plm_p (struct Cell *** *theCells*, struct Grid * *theGrid*)

Definition at line 107 of file cell_plm.c.

2.10.2.2 void cell_plm_rz (struct Cell *** *theCells*, struct Grid * *theGrid*, struct Face * *theFaces*, int *Nf*, int *rz*)

Definition at line 11 of file cell_plm.c.

2.11 src/Cell/cell_retrieve_data.c File Reference

```
#include <stdlib.h>
#include <stdio.h>
#include <math.h>
#include "../Headers/Cell.h"
#include "../Headers/Grid.h"
#include "../Headers/Face.h"
#include "../Headers/GravMass.h"
#include "../Headers/header.h"
```

Macros

- `#define CELL_PRIVATE_DEFS`

Functions

- `double * cell_prims (struct Cell *theCell)`
- `double * cell_grad (struct Cell *theCell)`
- `double * cell_gradp (struct Cell *theCell)`
- `struct Cell * cell_single (struct Cell ***theCells, int i, int j, int k)`
- `double cell_tiph (struct Cell *oneCell)`
- `double cell_dphi (struct Cell *oneCell)`
- `double cell_wiph (struct Cell *oneCell)`

2.11.1 Macro Definition Documentation

2.11.1.1 `#define CELL_PRIVATE_DEFS`

Definition at line 1 of file cell_retrieve_data.c.

2.11.2 Function Documentation

2.11.2.1 `double cell_dphi (struct Cell * oneCell)`

Definition at line 26 of file cell_retrieve_data.c.

2.11.2.2 `double* cell_grad (struct Cell * theCell)`

Definition at line 14 of file cell_retrieve_data.c.

2.11.2.3 `double* cell_gradp (struct Cell * theCell)`

Definition at line 17 of file cell_retrieve_data.c.

2.11.2.4 `double* cell_prims (struct Cell * theCell)`

Definition at line 11 of file cell_retrieve_data.c.

2.11.2.5 `struct Cell* cell_single (struct Cell *** theCells, int i, int j, int k)` [read]

Definition at line 20 of file cell_retrieve_data.c.

2.11.2.6 `double cell_tiph (struct Cell * oneCell)`

Definition at line 23 of file cell_retrieve_data.c.

2.11.2.7 `double cell_wiph (struct Cell * oneCell)`

Definition at line 29 of file cell_retrieve_data.c.

2.12 src/Cell/cell_set_w.c File Reference

```
#include <stdlib.h>
#include <stdio.h>
#include <math.h>
#include "../Headers/Cell.h"
#include "../Headers/Grid.h"
#include "../Headers/Face.h"
#include "../Headers/GravMass.h"
#include "../Headers/header.h"
```

Macros

- `#define CELL_PRIVATE_DEFS`

Functions

- void `cell_set_wcell` (struct Cell ****theCells*, struct Grid **theGrid*)
- void `cell_set_wrigid` (struct Cell ****theCells*, struct Grid **theGrid*)

2.12.1 Macro Definition Documentation

2.12.1.1 `#define CELL_PRIVATE_DEFS`

Definition at line 1 of file cell_set_w.c.

2.12.2 Function Documentation

2.12.2.1 `void cell_set_wcell (struct Cell *** theCells, struct Grid * theGrid)`

Definition at line 13 of file cell_set_w.c.

2.12.2.2 `void cell_set_wrigid (struct Cell *** theCells, struct Grid * theGrid)`

Definition at line 32 of file cell_set_w.c.

2.13 src/Cell/cell_source.c File Reference

```
#include <stdlib.h>
#include <stdio.h>
#include <math.h>
#include "../Headers/Cell.h"
#include "../Headers/Grid.h"
#include "../Headers/Face.h"
#include "../Headers/GravMass.h"
#include "../Headers/header.h"
```

Macros

- [#define CELL_PRIVATE_DEFS](#)

Functions

- double [fgrav](#) (double *M*, double *r*, double *eps*, double *n*)
- void [gravMassForce](#) (struct GravMass **theGravMasses*, struct Grid **theGrid*, int *p*, double *r*, double *phi*, double **fr*, double **fp*)
- void [cell_add_src](#) (struct Cell ****theCells*, struct Grid **theGrid*, struct GravMass **theGravMasses*, double *dt*)

2.13.1 Macro Definition Documentation

2.13.1.1 #define CELL_PRIVATE_DEFS

Definition at line 1 of file cell_source.c.

2.13.2 Function Documentation

2.13.2.1 void cell_add_src (struct Cell *** *theCells*, struct Grid * *theGrid*, struct GravMass * *theGravMasses*, double *dt*)

Definition at line 119 of file cell_source.c.

2.13.2.2 double fgrav (double *M*, double *r*, double *eps*, double *n*)

Definition at line 12 of file cell_source.c.

2.13.2.3 void gravMassForce (struct GravMass * *theGravMasses*, struct Grid * *theGrid*, int *p*, double *r*, double *phi*, double * *fr*, double * *fp*)

Definition at line 16 of file cell_source.c.

2.14 src/Cell/cell_sync.c File Reference

```
#include <stdlib.h>
#include <stdio.h>
#include <math.h>
#include "../Headers/Cell.h"
#include "../Headers/Grid.h"
#include "../Headers/Face.h"
#include "../Headers/GravMass.h"
#include "../Headers/MPIsetup.h"
#include "../Headers/header.h"
```

Macros

- #define [CELL_PRIVATE_DEFS](#)

Functions

- void [cell_syncproc_r](#) (struct Cell ***theCells, struct Grid *theGrid, struct MPIsetup *theMPIsetup)
- void [cell_syncproc_z](#) (struct Cell ***theCells, struct Grid *theGrid, struct MPIsetup *theMPIsetup)

2.14.1 Macro Definition Documentation

2.14.1.1 #define CELL_PRIVATE_DEFS

Definition at line 1 of file cell_sync.c.

2.14.2 Function Documentation

2.14.2.1 void cell_syncproc_r (struct Cell *** *theCells*, struct Grid * *theGrid*, struct MPIsetup * *theMPIsetup*)

Definition at line 12 of file cell_sync.c.

2.14.2.2 void cell_syncproc_z (struct Cell *** *theCells*, struct Grid * *theGrid*, struct MPIsetup * *theMPIsetup*)

Definition at line 158 of file cell_sync.c.

2.15 src/Face/face_access.c File Reference

```
#include <stdlib.h>
#include <stdio.h>
#include <math.h>
#include "../Headers/Grid.h"
#include "../Headers/Face.h"
#include "../Headers/Cell.h"
#include "../Headers/header.h"
```

Macros

- `#define` [FACE_PRIVATE_DEFS](#)

Functions

- `struct Face *` [face_pointer](#) (`struct Face *theFaces, int n`)
- `struct Cell *` [face_L_pointer](#) (`struct Face *theFaces, int n`)
- `struct Cell *` [face_R_pointer](#) (`struct Face *theFaces, int n`)
- `double` [face_deltaL](#) (`struct Face *thisface`)
- `double` [face_deltaR](#) (`struct Face *thisface`)
- `double` [face_cm](#) (`struct Face *thisface`)
- `double` [face_dA](#) (`struct Face *thisface`)
- `double` [face_r](#) (`struct Face *thisface`)

2.15.1 Macro Definition Documentation

2.15.1.1 `#define` [FACE_PRIVATE_DEFS](#)

Definition at line 1 of file `face_access.c`.

2.15.2 Function Documentation

2.15.2.1 `double` [face_cm](#) (`struct Face *` *thisface*)

Definition at line 26 of file `face_access.c`.

2.15.2.2 `double` [face_dA](#) (`struct Face *` *thisface*)

Definition at line 29 of file `face_access.c`.

2.15.2.3 `double` [face_deltaL](#) (`struct Face *` *thisface*)

Definition at line 20 of file `face_access.c`.

2.15.2.4 `double` [face_deltaR](#) (`struct Face *` *thisface*)

Definition at line 23 of file `face_access.c`.

2.15.2.5 `struct Cell*` [face_L_pointer](#) (`struct Face *` *theFaces*, `int` *n*) [read]

Definition at line 14 of file `face_access.c`.

2.15.2.6 `struct Face*` [face_pointer](#) (`struct Face *` *theFaces*, `int` *n*) [read]

Definition at line 11 of file `face_access.c`.

2.15.2.7 `double` [face_r](#) (`struct Face *` *thisface*)

Definition at line 32 of file `face_access.c`.

2.15.2.8 `struct Cell* face_R_pointer (struct Face * theFaces, int n)` [read]

Definition at line 17 of file `face_access.c`.

2.16 src/Face/face_create_destroy.c File Reference

```
#include <stdlib.h>
#include <stdio.h>
#include <math.h>
#include "../Headers/Grid.h"
#include "../Headers/Face.h"
#include "../Headers/Cell.h"
#include "../Headers/TimeStep.h"
#include "../Headers/header.h"
```

Macros

- `#define` [FACE_PRIVATE_DEFS](#)

Functions

- void [addFace](#) (struct Face **theFaces*, int *n*, struct Cell **cL*, struct Cell **cR*, double *r*, double *deltaL*, double *deltaR*, double *dphi*, double *tp*, double *dz*)
- void [face_build_r](#) (struct Cell ****theCells*, struct Face **theFaces*, int **nri*, int *mode*, struct Grid **theGrid*)
- void [face_build_z](#) (struct Cell ****theCells*, struct Face **theFaces*, int **nzK*, int *mode*, struct Grid **theGrid*)
- struct Face * [face_create_r](#) (struct Cell ****theCells*, struct Grid **theGrid*, struct TimeStep **theTimeStep*)
- struct Face * [face_create_z](#) (struct Cell ****theCells*, struct Grid **theGrid*, struct TimeStep **theTimeStep*)
- void [face_destroy](#) (struct Face **theFaces*)

2.16.1 Macro Definition Documentation

2.16.1.1 `#define` [FACE_PRIVATE_DEFS](#)

Definition at line 1 of file `face_create_destroy.c`.

2.16.2 Function Documentation

2.16.2.1 void [addFace](#) (struct Face * *theFaces*, int *n*, struct Cell * *cL*, struct Cell * *cR*, double *r*, double *deltaL*, double *deltaR*, double *dphi*, double *tp*, double *dz*)

Definition at line 11 of file `face_create_destroy.c`.

2.16.2.2 void [face_build_r](#) (struct Cell *** *theCells*, struct Face * *theFaces*, int * *nri*, int *mode*, struct Grid * *theGrid*)

Definition at line 22 of file `face_create_destroy.c`.

2.16.2.3 void [face_build_z](#) (struct Cell *** *theCells*, struct Face * *theFaces*, int * *nzK*, int *mode*, struct Grid * *theGrid*)

Definition at line 108 of file `face_create_destroy.c`.

2.16.2.4 `struct Face* face_create_r (struct Cell *** theCells, struct Grid * theGrid, struct TimeStep * theTimeStep)`
`[read]`

Definition at line 195 of file `face_create_destroy.c`.

2.16.2.5 `struct Face* face_create_z (struct Cell *** theCells, struct Grid * theGrid, struct TimeStep * theTimeStep)`
`[read]`

Definition at line 206 of file `face_create_destroy.c`.

2.16.2.6 `void face_destroy (struct Face * theFaces)`

Definition at line 218 of file `face_create_destroy.c`.

2.17 `src/GravMass/GravMass_access.c` File Reference

```
#include <stdlib.h>
#include <math.h>
#include "../Headers/GravMass.h"
#include "../Headers/header.h"
```

Macros

- `#define PLANET_PRIVATE_DEFS`

Functions

- double `gravMass_r` (struct GravMass **theGravMasses*, int *p*)
- double `gravMass_phi` (struct GravMass **theGravMasses*, int *p*)
- double `gravMass_M` (struct GravMass **theGravMasses*, int *p*)

2.17.1 Macro Definition Documentation

2.17.1.1 `#define PLANET_PRIVATE_DEFS`

Definition at line 1 of file `GravMass_access.c`.

2.17.2 Function Documentation

2.17.2.1 `double gravMass_M (struct GravMass * theGravMasses, int p)`

Definition at line 13 of file `GravMass_access.c`.

2.17.2.2 `double gravMass_phi (struct GravMass * theGravMasses, int p)`

Definition at line 10 of file `GravMass_access.c`.

2.17.2.3 double gravMass_r (struct GravMass * *theGravMasses*, int *p*)

Definition at line 7 of file GravMass_access.c.

2.18 src/GravMass/GravMass_create_destroy.c File Reference

```
#include <stdlib.h>
#include <math.h>
#include "../Headers/GravMass.h"
#include "../Headers/header.h"
```

Macros

- #define [PLANET_PRIVATE_DEFS](#)

Functions

- struct GravMass * [gravMass_create](#) (int num_gravMasses)
- void [gravMass_destroy](#) (struct GravMass *theGravMasses)

2.18.1 Macro Definition Documentation

2.18.1.1 #define PLANET_PRIVATE_DEFS

Definition at line 1 of file GravMass_create_destroy.c.

2.18.2 Function Documentation

2.18.2.1 struct GravMass* gravMass_create (int *num_gravMasses*) [read]

Definition at line 7 of file GravMass_create_destroy.c.

2.18.2.2 void gravMass_destroy (struct GravMass * *theGravMasses*)

Definition at line 12 of file GravMass_create_destroy.c.

2.19 src/GravMass/GravMass_init.c File Reference

```
#include <stdlib.h>
#include <math.h>
#include "../Headers/GravMass.h"
#include "../Headers/header.h"
```

Macros

- #define [PLANET_PRIVATE_DEFS](#)

Functions

- void [gravMass_initialize](#) (struct GravMass *theGravMasses)

2.19.1 Macro Definition Documentation

2.19.1.1 #define PLANET_PRIVATE_DEFS

Definition at line 1 of file GravMass_init.c.

2.19.2 Function Documentation

2.19.2.1 void gravMass_initialize (struct GravMass * *theGravMasses*)

Definition at line 7 of file GravMass_init.c.

2.20 src/GravMass/GravMass_misc.c File Reference

```
#include <stdlib.h>
#include <math.h>
#include "../Headers/GravMass.h"
#include "../Headers/Grid.h"
#include "../Headers/header.h"
```

Macros

- #define [PLANET_PRIVATE_DEFS](#)

Functions

- void [gravMass_clean_pi](#) (struct GravMass *theGravMasses, struct Grid *theGrid)
- void [gravMass_copy](#) (struct GravMass *theGravMasses, struct Grid *theGrid)

2.20.1 Macro Definition Documentation

2.20.1.1 #define PLANET_PRIVATE_DEFS

Definition at line 1 of file GravMass_misc.c.

2.20.2 Function Documentation

2.20.2.1 void gravMass_clean_pi (struct GravMass * *theGravMasses*, struct Grid * *theGrid*)

Definition at line 8 of file GravMass_misc.c.

2.20.2.2 void gravMass_copy (struct GravMass * *theGravMasses*, struct Grid * *theGrid*)

Definition at line 18 of file GravMass_misc.c.

2.21 src/Grid/grid_access.c File Reference

```
#include <stdlib.h>
#include <stdio.h>
#include "../Headers/Grid.h"
#include "../Headers/header.h"
```

Macros

- `#define GRID_PRIVATE_DEFS`

Functions

- `int grid_N_p` (struct Grid *theGrid, int i)
- `double grid_r_faces` (struct Grid *theGrid, int i)
- `double grid_z_faces` (struct Grid *theGrid, int k)
- `int grid_N_r` (struct Grid *theGrid)
- `int grid_N_z` (struct Grid *theGrid)
- `int grid_Ncells` (struct Grid *theGrid)
- `int grid_Restart` (struct Grid *theGrid)
- `int grid_Ncells_global` (struct Grid *theGrid)
- `int grid_offset` (struct Grid *theGrid)
- `int grid_Nghost_rmin` (struct Grid *theGrid)
- `int grid_Nghost_rmax` (struct Grid *theGrid)
- `int grid_Nghost_zmin` (struct Grid *theGrid)
- `int grid_Nghost_zmax` (struct Grid *theGrid)
- `int grid_ng` (struct Grid *theGrid)
- `int grid_N_z_global` (struct Grid *theGrid)
- `int grid_NUM_Q` (struct Grid *theGrid)
- `int grid_MOVE_CELLS` (struct Grid *theGrid)
- `int grid_NumGravMass` (struct Grid *theGrid)
- `double grid_GAMMALAW` (struct Grid *theGrid)
- `int grid_INCLUDE_VISCOSITY` (struct Grid *theGrid)
- `double grid_EXPLICIT_VISCOSITY` (struct Grid *theGrid)
- `double grid_DIVB_CH` (struct Grid *theGrid)
- `double grid_DIVB_L` (struct Grid *theGrid)
- `double grid_CFL` (struct Grid *theGrid)
- `double grid_PLM` (struct Grid *theGrid)
- `int grid_POWELL` (struct Grid *theGrid)
- `int grid_GRAV2D` (struct Grid *theGrid)
- `double grid_G_EPS` (struct Grid *theGrid)
- `double grid_PHI_ORDER` (struct Grid *theGrid)
- `double grid_RHO_FLOOR` (struct Grid *theGrid)
- `double grid_CS_FLOOR` (struct Grid *theGrid)
- `double grid_CS_CAP` (struct Grid *theGrid)
- `double grid_VEL_CAP` (struct Grid *theGrid)
- `double grid_get_T_MAX` (struct Grid *theGrid)
- `double grid_NUM_CHECKPOINTS` (struct Grid *theGrid)

2.21.1 Macro Definition Documentation

2.21.1.1 `#define GRID_PRIVATE_DEFS`

Definition at line 1 of file `grid_access.c`.

2.21.2 Function Documentation

2.21.2.1 `double grid_CFL (struct Grid * theGrid)`

Definition at line 77 of file `grid_access.c`.

2.21.2.2 `double grid_CS_CAP (struct Grid * theGrid)`

Definition at line 101 of file `grid_access.c`.

2.21.2.3 `double grid_CS_FLOOR (struct Grid * theGrid)`

Definition at line 98 of file `grid_access.c`.

2.21.2.4 `double grid_DIVB_CH (struct Grid * theGrid)`

Definition at line 71 of file `grid_access.c`.

2.21.2.5 `double grid_DIVB_L (struct Grid * theGrid)`

Definition at line 74 of file `grid_access.c`.

2.21.2.6 `double grid_EXPLICIT_VISCOSITY (struct Grid * theGrid)`

Definition at line 68 of file `grid_access.c`.

2.21.2.7 `double grid_G_EPS (struct Grid * theGrid)`

Definition at line 89 of file `grid_access.c`.

2.21.2.8 `double grid_GAMMALAW (struct Grid * theGrid)`

Definition at line 62 of file `grid_access.c`.

2.21.2.9 `double grid_get_T_MAX (struct Grid * theGrid)`

Definition at line 107 of file `grid_access.c`.

2.21.2.10 `int grid_GRAV2D (struct Grid * theGrid)`

Definition at line 86 of file `grid_access.c`.

2.21.2.11 int grid_INCLUDE_VISCOSITY (struct Grid * *theGrid*)

Definition at line 65 of file grid_access.c.

2.21.2.12 int grid_MOVE_CELLS (struct Grid * *theGrid*)

Definition at line 56 of file grid_access.c.

2.21.2.13 int grid_N_p (struct Grid * *theGrid*, int *i*)

Definition at line 8 of file grid_access.c.

2.21.2.14 int grid_N_r (struct Grid * *theGrid*)

Definition at line 17 of file grid_access.c.

2.21.2.15 int grid_N_z (struct Grid * *theGrid*)

Definition at line 20 of file grid_access.c.

2.21.2.16 int grid_N_z_global (struct Grid * *theGrid*)

Definition at line 50 of file grid_access.c.

2.21.2.17 int grid_Ncells (struct Grid * *theGrid*)

Definition at line 23 of file grid_access.c.

2.21.2.18 int grid_Ncells_global (struct Grid * *theGrid*)

Definition at line 29 of file grid_access.c.

2.21.2.19 int grid_ng (struct Grid * *theGrid*)

Definition at line 47 of file grid_access.c.

2.21.2.20 int grid_Nghost_rmax (struct Grid * *theGrid*)

Definition at line 38 of file grid_access.c.

2.21.2.21 int grid_Nghost_rmin (struct Grid * *theGrid*)

Definition at line 35 of file grid_access.c.

2.21.2.22 int grid_Nghost_zmax (struct Grid * *theGrid*)

Definition at line 44 of file grid_access.c.

2.21.2.23 `int grid_Nghost_zmin (struct Grid * theGrid)`

Definition at line 41 of file `grid_access.c`.

2.21.2.24 `double grid_NUM_CHECKPOINTS (struct Grid * theGrid)`

Definition at line 110 of file `grid_access.c`.

2.21.2.25 `int grid_NUM_Q (struct Grid * theGrid)`

Definition at line 53 of file `grid_access.c`.

2.21.2.26 `int grid_NumGravMass (struct Grid * theGrid)`

Definition at line 59 of file `grid_access.c`.

2.21.2.27 `int grid_offset (struct Grid * theGrid)`

Definition at line 32 of file `grid_access.c`.

2.21.2.28 `double grid_PHI_ORDER (struct Grid * theGrid)`

Definition at line 92 of file `grid_access.c`.

2.21.2.29 `double grid_PLM (struct Grid * theGrid)`

Definition at line 80 of file `grid_access.c`.

2.21.2.30 `int grid_POWELL (struct Grid * theGrid)`

Definition at line 83 of file `grid_access.c`.

2.21.2.31 `double grid_r_faces (struct Grid * theGrid, int i)`

Definition at line 11 of file `grid_access.c`.

2.21.2.32 `int grid_Restart (struct Grid * theGrid)`

Definition at line 26 of file `grid_access.c`.

2.21.2.33 `double grid_RHO_FLOOR (struct Grid * theGrid)`

Definition at line 95 of file `grid_access.c`.

2.21.2.34 `double grid_VEL_CAP (struct Grid * theGrid)`

Definition at line 104 of file `grid_access.c`.

2.21.2.35 `double grid_z_faces (struct Grid * theGrid, int k)`

Definition at line 14 of file `grid_access.c`.

2.22 src/Grid/grid_create_destroy.c File Reference

```
#include <stdlib.h>
#include <stdio.h>
#include "../Headers/Grid.h"
#include "../Headers/MPIsetup.h"
#include "../Headers/header.h"
```

Macros

- `#define GRID_PRIVATE_DEFS`

Functions

- `struct Grid * grid_create (struct MPIsetup *theMPIsetup)`
- `void grid_destroy (struct Grid *theGrid)`

2.22.1 Macro Definition Documentation

2.22.1.1 `#define GRID_PRIVATE_DEFS`

Definition at line 1 of file `grid_create_destroy.c`.

2.22.2 Function Documentation

2.22.2.1 `struct Grid* grid_create (struct MPIsetup * theMPIsetup)` [read]

Definition at line 9 of file `grid_create_destroy.c`.

2.22.2.2 `void grid_destroy (struct Grid * theGrid)`

Definition at line 76 of file `grid_create_destroy.c`.

2.23 src/Grid/grid_set.c File Reference

```
#include <stdlib.h>
#include <stdio.h>
#include <math.h>
#include <string.h>
#include "../Headers/Grid.h"
#include "../Headers/MPIsetup.h"
#include "../Headers/header.h"
```

Macros

- #define [GRID_PRIVATE_DEFS](#)

Enumerations

- enum { [VAR_INT](#), [VAR_DOUB](#), [VAR_STR](#) }

Functions

- void [grid_set_N_p](#) (struct Grid *theGrid)
- void [grid_set_rz](#) (struct Grid *theGrid, struct MPIsetup *theMPIsetup)
- void [grid_set_Ncells_and_offset](#) (struct Grid *theGrid, struct MPIsetup *theMPIsetup)
- int [readvar](#) (char *filename, char *varname, int vartype, void *ptr)
- int [grid_read_par_file](#) (struct Grid *theGrid, struct MPIsetup *theMPIsetup, char *inputfilename)

2.23.1 Macro Definition Documentation

2.23.1.1 #define GRID_PRIVATE_DEFS

Definition at line 1 of file grid_set.c.

2.23.2 Enumeration Type Documentation

2.23.2.1 anonymous enum

Enumerator

VAR_INT

VAR_DOUB

VAR_STR

Definition at line 69 of file grid_set.c.

2.23.3 Function Documentation

2.23.3.1 int grid_read_par_file (struct Grid * *theGrid*, struct MPIsetup * *theMPIsetup*, char * *inputfilename*)

Definition at line 110 of file grid_set.c.

2.23.3.2 void grid_set_N_p (struct Grid * *theGrid*)

Definition at line 10 of file grid_set.c.

2.23.3.3 void grid_set_Ncells_and_offset (struct Grid * *theGrid*, struct MPIsetup * *theMPIsetup*)

Definition at line 41 of file grid_set.c.

2.23.3.4 void grid_set_rz (struct Grid * *theGrid*, struct MPIsetup * *theMPIsetup*)

Definition at line 17 of file grid_set.c.

2.23.3.5 `int readvar (char * filename, char * varname, int vartype, void * ptr)`

Definition at line 71 of file `grid_set.c`.

2.24 src/Headers/Cell.h File Reference

Functions

- `struct Cell *** cell_create` (`struct Grid *`, `struct MPIsetup *`)
- `void cell_destroy` (`struct Cell ***`, `struct Grid *`)
- `void cell_init` (`struct Cell ***`, `struct Grid *`, `struct MPIsetup *`)
- `void cell_single_init` (`struct Cell ***`, `struct Grid *`, `int`, `int`, `int`)
- `double * cell_prims` (`struct Cell *`)
- `double * cell_grad` (`struct Cell *`)
- `double * cell_gradp` (`struct Cell *`)
- `struct Cell * cell_single` (`struct Cell ***`, `int`, `int`, `int`)
- `double cell_tiph` (`struct Cell *`)
- `double cell_dphi` (`struct Cell *`)
- `double cell_wiph` (`struct Cell *`)
- `void cell_add_cons` (`struct Cell *`, `int`, `double`)
- `void cell_add_divB` (`struct Cell *`, `double`)
- `void cell_add_GradPsi` (`struct Cell *`, `int`, `double`)
- `void cell_add_wiph` (`struct Cell *`, `double`)
- `void cell_add_src` (`struct Cell ***`, `struct Grid *`, `struct GravMass *`, `double`)
- `void cell_mult_psi` (`struct Cell *`, `double`)
- `void cell_clean_pi` (`struct Cell ***`, `struct Grid *`)
- `void cell_update_phi` (`struct Cell ***`, `struct Grid *`, `double`, `double`)
- `void cell_update_dphi` (`struct Cell ***`, `struct Grid *`)
- `void cell_clear_w` (`struct Cell ***`, `struct Grid *`)
- `void cell_clear_divB` (`struct Cell ***`, `struct Grid *`)
- `void cell_clear_GradPsi` (`struct Cell ***`, `struct Grid *`)
- `void cell_set_wcell` (`struct Cell ***`, `struct Grid *`)
- `void cell_set_wrigid` (`struct Cell ***`, `struct Grid *`)
- `void cell_syncproc_r` (`struct Cell ***`, `struct Grid *`, `struct MPIsetup *`)
- `void cell_syncproc_z` (`struct Cell ***`, `struct Grid *`, `struct MPIsetup *`)
- `void cell_plm_rz` (`struct Cell ***`, `struct Grid *`, `struct Face *`, `int`, `int`)
- `void cell_plm_p` (`struct Cell ***`, `struct Grid *`)
- `void cell_flux_p` (`struct Cell ***`, `struct Grid *`, `double`)
- `void cell_boundary_outflow_r` (`struct Cell ***`, `struct Face *`, `struct Grid *`, `struct MPIsetup *`, `int *`)
- `void cell_boundary_outflow_z` (`struct Cell ***`, `struct Face *`, `struct Grid *`, `struct MPIsetup *`, `int *`)
- `void cell_boundary_fixed_r` (`struct Cell ***`, `struct Grid *`, `struct MPIsetup *`)
- `void cell_calc_prim` (`struct Cell ***`, `struct Grid *`)
- `void cell_prim2cons` (`double *`, `double *`, `double`, `double`, `double`)
- `void cell_calc_cons` (`struct Cell ***`, `struct Grid *`)
- `void cell_cons2prim` (`double *`, `double *`, `double`, `double`, `struct Grid *`)
- `double cell_mindt` (`struct Cell ***`, `struct Grid *`)
- `void cell_copy` (`struct Cell ***`, `struct Grid *`)
- `void cell_adjust_RK_cons` (`struct Cell ***`, `struct Grid *`, `double`)
- `void cell_set_prim` (`struct Cell ***`, `int`, `int`, `int`, `int`, `double`)
- `void cell_set_tiph` (`struct Cell ***`, `int`, `int`, `int`, `double`)

2.24.1 Function Documentation

2.24.1.1 void cell_add_cons (struct Cell *, int, double)

Definition at line 11 of file cell_modify_data.c.

2.24.1.2 void cell_add_divB (struct Cell *, double)

Definition at line 14 of file cell_modify_data.c.

2.24.1.3 void cell_add_GradPsi (struct Cell *, int, double)

Definition at line 17 of file cell_modify_data.c.

2.24.1.4 void cell_add_src (struct Cell ***, struct Grid *, struct GravMass *, double)

Definition at line 119 of file cell_source.c.

2.24.1.5 void cell_add_wiph (struct Cell *, double)

Definition at line 20 of file cell_modify_data.c.

2.24.1.6 void cell_adjust_RK_cons (struct Cell ***, struct Grid *, double)

Definition at line 47 of file cell_misc.c.

2.24.1.7 void cell_boundary_fixed_r (struct Cell ***, struct Grid *, struct MPIsetup *)

Definition at line 162 of file cell_boundary.c.

2.24.1.8 void cell_boundary_outflow_r (struct Cell ***, struct Face *, struct Grid *, struct MPIsetup *, int *)

Definition at line 13 of file cell_boundary.c.

2.24.1.9 void cell_boundary_outflow_z (struct Cell ***, struct Face *, struct Grid *, struct MPIsetup *, int *)

Definition at line 91 of file cell_boundary.c.

2.24.1.10 void cell_calc_cons (struct Cell ***, struct Grid *)

Definition at line 50 of file cell_conversion.c.

2.24.1.11 void cell_calc_prim (struct Cell ***, struct Grid *)

Definition at line 181 of file cell_conversion.c.

2.24.1.12 void cell_clean_pi (struct Cell ***, struct Grid *)

Definition at line 12 of file cell_misc.c.

2.24.1.13 void cell_clear_divB (struct Cell ***, struct Grid *)

Definition at line 25 of file cell_clear.c.

2.24.1.14 void cell_clear_GradPsi (struct Cell ***, struct Grid *)

Definition at line 38 of file cell_clear.c.

2.24.1.15 void cell_clear_w (struct Cell ***, struct Grid *)

Definition at line 12 of file cell_clear.c.

2.24.1.16 void cell_cons2prim (double *, double *, double, double, struct Grid *)

Definition at line 126 of file cell_conversion.c.

2.24.1.17 void cell_copy (struct Cell ***, struct Grid *)

Definition at line 30 of file cell_misc.c.

2.24.1.18 struct Cell*** cell_create (struct Grid *, struct MPIsetup *) [read]

Definition at line 12 of file cell_create_destroy.c.

2.24.1.19 void cell_destroy (struct Cell ***, struct Grid *)

Definition at line 86 of file cell_create_destroy.c.

2.24.1.20 double cell_dphi (struct Cell *)

Definition at line 26 of file cell_retrieve_data.c.

2.24.1.21 void cell_flux_p (struct Cell ***, struct Grid *, double)

Definition at line 12 of file cell_flux_p.c.

2.24.1.22 double* cell_grad (struct Cell *)

Definition at line 14 of file cell_retrieve_data.c.

2.24.1.23 double* cell_gradp (struct Cell *)

Definition at line 17 of file cell_retrieve_data.c.

2.24.1.24 void cell_init (struct Cell ***, struct Grid *, struct MPIsetup *)

Definition at line 39 of file cell_init.c.

2.24.1.25 `double cell_mindt (struct Cell ***, struct Grid *)`

Definition at line 33 of file `cell_mindt.c`.

2.24.1.26 `void cell_mult_psi (struct Cell *, double)`

Definition at line 23 of file `cell_modify_data.c`.

2.24.1.27 `void cell_plm_p (struct Cell ***, struct Grid *)`

Definition at line 107 of file `cell_plm.c`.

2.24.1.28 `void cell_plm_rz (struct Cell ***, struct Grid *, struct Face *, int , int)`

Definition at line 11 of file `cell_plm.c`.

2.24.1.29 `void cell_prim2cons (double *, double *, double , double , double)`

Definition at line 12 of file `cell_conversion.c`.

2.24.1.30 `double* cell_prims (struct Cell *)`

Definition at line 11 of file `cell_retrieve_data.c`.

2.24.1.31 `void cell_set_prim (struct Cell ***, int , int , int , int , double)`

Definition at line 28 of file `cell_modify_data.c`.

2.24.1.32 `void cell_set_tiph (struct Cell ***, int , int , int , double)`

Definition at line 31 of file `cell_modify_data.c`.

2.24.1.33 `void cell_set_wcell (struct Cell ***, struct Grid *)`

Definition at line 13 of file `cell_set_w.c`.

2.24.1.34 `void cell_set_wrigid (struct Cell ***, struct Grid *)`

Definition at line 32 of file `cell_set_w.c`.

2.24.1.35 `struct Cell* cell_single (struct Cell ***, int , int , int)` [read]

Definition at line 20 of file `cell_retrieve_data.c`.

2.24.1.36 `void cell_single_init (struct Cell ***, struct Grid *, int , int , int)`

Definition at line 12 of file `cell_init.c`.

2.24.1.37 void cell_syncproc_r (struct Cell ***, struct Grid *, struct MPIsetup *)

Definition at line 12 of file cell_sync.c.

2.24.1.38 void cell_syncproc_z (struct Cell ***, struct Grid *, struct MPIsetup *)

Definition at line 158 of file cell_sync.c.

2.24.1.39 double cell_tiph (struct Cell *)

Definition at line 23 of file cell_retrieve_data.c.

2.24.1.40 void cell_update_dphi (struct Cell ***, struct Grid *)

Definition at line 87 of file cell_misc.c.

2.24.1.41 void cell_update_phi (struct Cell ***, struct Grid *, double , double)

Definition at line 65 of file cell_misc.c.

2.24.1.42 double cell_wiph (struct Cell *)

Definition at line 29 of file cell_retrieve_data.c.

2.25 src/Headers/Face.h File Reference

Functions

- struct Face * [face_create_r](#) (struct Cell ***, struct Grid *, struct TimeStep *)
- struct Face * [face_create_z](#) (struct Cell ***, struct Grid *, struct TimeStep *)
- void [face_destroy](#) (struct Face *)
- struct Face * [face_pointer](#) (struct Face *, int)
- struct Cell * [face_L_pointer](#) (struct Face *, int)
- struct Cell * [face_R_pointer](#) (struct Face *, int)
- double [face_deltaL](#) (struct Face *)
- double [face_deltaR](#) (struct Face *)
- double [face_cm](#) (struct Face *)
- double [face_dA](#) (struct Face *)
- double [face_r](#) (struct Face *)

2.25.1 Function Documentation

2.25.1.1 double face_cm (struct Face *)

Definition at line 26 of file face_access.c.

2.25.1.2 struct Face* face_create_r (struct Cell ***, struct Grid *, struct TimeStep *) [\[read\]](#)

Definition at line 195 of file face_create_destroy.c.

2.25.1.3 `struct Face* face_create_z (struct Cell ***, struct Grid *, struct TimeStep *)` [read]

Definition at line 206 of file `face_create_destroy.c`.

2.25.1.4 `double face_dA (struct Face *)`

Definition at line 29 of file `face_access.c`.

2.25.1.5 `double face_deltaL (struct Face *)`

Definition at line 20 of file `face_access.c`.

2.25.1.6 `double face_deltaR (struct Face *)`

Definition at line 23 of file `face_access.c`.

2.25.1.7 `void face_destroy (struct Face *)`

Definition at line 218 of file `face_create_destroy.c`.

2.25.1.8 `struct Cell* face_L_pointer (struct Face *, int)` [read]

Definition at line 14 of file `face_access.c`.

2.25.1.9 `struct Face* face_pointer (struct Face *, int)` [read]

Definition at line 11 of file `face_access.c`.

2.25.1.10 `double face_r (struct Face *)`

Definition at line 32 of file `face_access.c`.

2.25.1.11 `struct Cell* face_R_pointer (struct Face *, int)` [read]

Definition at line 17 of file `face_access.c`.

2.26 src/Headers/GravMass.h File Reference

Functions

- `struct GravMass * gravMass_create (int)`
- `void gravMass_destroy (struct GravMass *)`
- `void gravMass_initialize (struct GravMass *)`
- `double gravMass_r (struct GravMass *, int)`
- `double gravMass_phi (struct GravMass *, int)`
- `double gravMass_M (struct GravMass *, int)`
- `void gravMass_clean_pi (struct GravMass *, struct Grid *)`
- `void gravMass_copy (struct GravMass *, struct Grid *)`

2.26.1 Function Documentation

2.26.1.1 void gravMass_clean_pi (struct GravMass *, struct Grid *)

Definition at line 8 of file GravMass_misc.c.

2.26.1.2 void gravMass_copy (struct GravMass *, struct Grid *)

Definition at line 18 of file GravMass_misc.c.

2.26.1.3 struct GravMass* gravMass_create (int) [read]

Definition at line 7 of file GravMass_create_destroy.c.

2.26.1.4 void gravMass_destroy (struct GravMass *)

Definition at line 12 of file GravMass_create_destroy.c.

2.26.1.5 void gravMass_initialize (struct GravMass *)

Definition at line 7 of file GravMass_init.c.

2.26.1.6 double gravMass_M (struct GravMass *, int)

Definition at line 13 of file GravMass_access.c.

2.26.1.7 double gravMass_phi (struct GravMass *, int)

Definition at line 10 of file GravMass_access.c.

2.26.1.8 double gravMass_r (struct GravMass *, int)

Definition at line 7 of file GravMass_access.c.

2.27 src/Headers/Grid.h File Reference

Functions

- struct Grid * [grid_create](#) (struct MPIsetup *)
- void [grid_destroy](#) (struct Grid *)
- int [grid_N_p](#) (struct Grid *, int)
- double [grid_r_faces](#) (struct Grid *, int)
- double [grid_z_faces](#) (struct Grid *, int)
- int [grid_N_r](#) (struct Grid *)
- int [grid_N_z](#) (struct Grid *)
- int [grid_Restart](#) (struct Grid *)
- int [grid_N_z_global](#) (struct Grid *)
- int [grid_Ncells](#) (struct Grid *)
- int [grid_Ncells_global](#) (struct Grid *)
- int [grid_offset](#) (struct Grid *)

- int [grid_ng](#) (struct Grid *)
- int [grid_Nghost_rmin](#) (struct Grid *)
- int [grid_Nghost_rmax](#) (struct Grid *)
- int [grid_Nghost_zmin](#) (struct Grid *)
- int [grid_Nghost_zmax](#) (struct Grid *)
- int [grid_MOVE_CELLS](#) (struct Grid *)
- int [grid_NumGravMass](#) (struct Grid *)
- double [grid_GAMMALAW](#) (struct Grid *)
- int [grid_INCLUDE_VISCOSITY](#) (struct Grid *)
- double [grid_EXPLICIT_VISCOSITY](#) (struct Grid *)
- double [grid_DIVB_CH](#) (struct Grid *)
- double [grid_DIVB_L](#) (struct Grid *)
- double [grid_CFL](#) (struct Grid *)
- double [grid_PLM](#) (struct Grid *)
- int [grid_POWELL](#) (struct Grid *)
- int [grid_GRAV2D](#) (struct Grid *)
- double [grid_G_EPS](#) (struct Grid *)
- double [grid_PHI_ORDER](#) (struct Grid *)
- double [grid_RHO_FLOOR](#) (struct Grid *)
- double [grid_CS_FLOOR](#) (struct Grid *)
- double [grid_CS_CAP](#) (struct Grid *)
- double [grid_VEL_CAP](#) (struct Grid *)
- int [grid_NUM_Q](#) (struct Grid *)
- double [grid_get_T_MAX](#) (struct Grid *)
- double [grid_NUM_CHECKPOINTS](#) (struct Grid *)
- int [grid_read_par_file](#) (struct Grid *, struct MPIsetup *, char *)
- void [grid_set_N_p](#) (struct Grid *)
- void [grid_set_rz](#) (struct Grid *, struct MPIsetup *)
- void [grid_set_Ncells_and_offset](#) (struct Grid *, struct MPIsetup *)

2.27.1 Function Documentation

2.27.1.1 double [grid_CFL](#) (struct Grid *)

Definition at line 77 of file [grid_access.c](#).

2.27.1.2 struct Grid* [grid_create](#) (struct MPIsetup *) [read]

Definition at line 9 of file [grid_create_destroy.c](#).

2.27.1.3 double [grid_CS_CAP](#) (struct Grid *)

Definition at line 101 of file [grid_access.c](#).

2.27.1.4 double [grid_CS_FLOOR](#) (struct Grid *)

Definition at line 98 of file [grid_access.c](#).

2.27.1.5 void [grid_destroy](#) (struct Grid *)

Definition at line 76 of file [grid_create_destroy.c](#).

2.27.1.6 `double grid_DIVB_CH (struct Grid *)`

Definition at line 71 of file `grid_access.c`.

2.27.1.7 `double grid_DIVB_L (struct Grid *)`

Definition at line 74 of file `grid_access.c`.

2.27.1.8 `double grid_EXPLICIT_VISCOSITY (struct Grid *)`

Definition at line 68 of file `grid_access.c`.

2.27.1.9 `double grid_G_EPS (struct Grid *)`

Definition at line 89 of file `grid_access.c`.

2.27.1.10 `double grid_GAMMALAW (struct Grid *)`

Definition at line 62 of file `grid_access.c`.

2.27.1.11 `double grid_get_T_MAX (struct Grid *)`

Definition at line 107 of file `grid_access.c`.

2.27.1.12 `int grid_GRAV2D (struct Grid *)`

Definition at line 86 of file `grid_access.c`.

2.27.1.13 `int grid_INCLUDE_VISCOSITY (struct Grid *)`

Definition at line 65 of file `grid_access.c`.

2.27.1.14 `int grid_MOVE_CELLS (struct Grid *)`

Definition at line 56 of file `grid_access.c`.

2.27.1.15 `int grid_N_p (struct Grid * , int)`

Definition at line 8 of file `grid_access.c`.

2.27.1.16 `int grid_N_r (struct Grid *)`

Definition at line 17 of file `grid_access.c`.

2.27.1.17 `int grid_N_z (struct Grid *)`

Definition at line 20 of file `grid_access.c`.

2.27.1.18 `int grid_Nz_global (struct Grid *)`

Definition at line 50 of file `grid_access.c`.

2.27.1.19 `int grid_Ncells (struct Grid *)`

Definition at line 23 of file `grid_access.c`.

2.27.1.20 `int grid_Ncells_global (struct Grid *)`

Definition at line 29 of file `grid_access.c`.

2.27.1.21 `int grid_ng (struct Grid *)`

Definition at line 47 of file `grid_access.c`.

2.27.1.22 `int grid_Nghost_rmax (struct Grid *)`

Definition at line 38 of file `grid_access.c`.

2.27.1.23 `int grid_Nghost_rmin (struct Grid *)`

Definition at line 35 of file `grid_access.c`.

2.27.1.24 `int grid_Nghost_zmax (struct Grid *)`

Definition at line 44 of file `grid_access.c`.

2.27.1.25 `int grid_Nghost_zmin (struct Grid *)`

Definition at line 41 of file `grid_access.c`.

2.27.1.26 `double grid_NUM_CHECKPOINTS (struct Grid *)`

Definition at line 110 of file `grid_access.c`.

2.27.1.27 `int grid_NUM_Q (struct Grid *)`

Definition at line 53 of file `grid_access.c`.

2.27.1.28 `int grid_NumGravMass (struct Grid *)`

Definition at line 59 of file `grid_access.c`.

2.27.1.29 `int grid_offset (struct Grid *)`

Definition at line 32 of file `grid_access.c`.

2.27.1.30 `double grid_PHI_ORDER (struct Grid *)`

Definition at line 92 of file `grid_access.c`.

2.27.1.31 `double grid_PLM (struct Grid *)`

Definition at line 80 of file `grid_access.c`.

2.27.1.32 `int grid_POWELL (struct Grid *)`

Definition at line 83 of file `grid_access.c`.

2.27.1.33 `double grid_r_faces (struct Grid * , int)`

Definition at line 11 of file `grid_access.c`.

2.27.1.34 `int grid_read_par_file (struct Grid * , struct MPIsetup * , char *)`

Definition at line 110 of file `grid_set.c`.

2.27.1.35 `int grid_Restart (struct Grid *)`

Definition at line 26 of file `grid_access.c`.

2.27.1.36 `double grid_RHO_FLOOR (struct Grid *)`

Definition at line 95 of file `grid_access.c`.

2.27.1.37 `void grid_set_N_p (struct Grid *)`

Definition at line 10 of file `grid_set.c`.

2.27.1.38 `void grid_set_Ncells_and_offset (struct Grid * , struct MPIsetup *)`

Definition at line 41 of file `grid_set.c`.

2.27.1.39 `void grid_set_rz (struct Grid * , struct MPIsetup *)`

Definition at line 17 of file `grid_set.c`.

2.27.1.40 `double grid_VEL_CAP (struct Grid *)`

Definition at line 104 of file `grid_access.c`.

2.27.1.41 `double grid_z_faces (struct Grid * , int)`

Definition at line 14 of file `grid_access.c`.

2.28 src/Headers/header.h File Reference

```
#include "mpi.h"
```

Enumerations

- enum {
 [RHO](#), [PPP](#), [URR](#), [UPP](#),
 [UZZ](#), [BRR](#), [BPP](#), [BZZ](#),
 [PSI](#) }
- enum {
 [DDD](#), [TAU](#), [SRR](#), [LLL](#),
 [SZZ](#) }
- enum { [C_FIXED](#), [C_WCELL](#), [C_WRIEMANN](#), [C_RIGID](#) }
- enum { [LEFT](#), [LEFTSTAR](#), [RIGHTSTAR](#), [RIGHT](#) }

Variables

- MPI_Comm [grid_comm](#)

2.28.1 Enumeration Type Documentation

2.28.1.1 anonymous enum

Enumerator

RHO
PPP
URR
UPP
UZZ
BRR
BPP
BZZ
PSI

Definition at line 1 of file header.h.

2.28.1.2 anonymous enum

Enumerator

DDD
TAU
SRR
LLL
SZZ

Definition at line 2 of file header.h.

2.28.1.3 anonymous enum

Enumerator

C_FIXED
C_WCELL
C_WRIEMANN
C_RIGID

Definition at line 3 of file header.h.

2.28.1.4 anonymous enum

Enumerator

LEFT
LEFTSTAR
RIGHTSTAR
RIGHT

Definition at line 4 of file header.h.

2.28.2 Variable Documentation

2.28.2.1 MPI_Comm grid_comm

Definition at line 6 of file header.h.

2.29 src/Headers/IO.h File Reference

Functions

- struct IO * [io_create](#) (struct Grid *)
- void [io_destroy](#) (struct IO *, struct Grid *)
- void [io_flattened_prim](#) (struct IO *, struct Cell ***, struct Grid *)
- void [io_unflattened_prim](#) (struct IO *, struct Cell ***, struct Grid *)
- void [io_hdf5_out](#) (struct IO *, struct Grid *, char *)
- void [io_hdf5_in](#) (struct IO *, struct Grid *, char *)

2.29.1 Function Documentation

2.29.1.1 struct IO* io_create (struct Grid *) [read]

Definition at line 14 of file io_create_destroy.c.

2.29.1.2 void io.destroy (struct IO *, struct Grid *)

Definition at line 32 of file io_create_destroy.c.

2.29.1.3 void io.flattened_prim (struct IO *, struct Cell ***, struct Grid *)

Definition at line 14 of file io_flatten_unflatten.c.

2.29.1.4 `void io_hdf5_in (struct IO *, struct Grid *, char *)`

Definition at line 87 of file `io_hdf5.c`.

2.29.1.5 `void io_hdf5_out (struct IO *, struct Grid *, char *)`

Definition at line 14 of file `io_hdf5.c`.

2.29.1.6 `void io_unflattened_prim (struct IO *, struct Cell ***, struct Grid *)`

Definition at line 35 of file `io_flatten_unflatten.c`.

2.30 `src/Headers/MPIsetup.h` File Reference

Functions

- `struct MPIsetup * mpisetup_create` (int, char **)
- `void mpisetup_destroy` (struct MPIsetup *)
- `void mpisetup_setprocs` (struct MPIsetup *)
- `void mpisetup_cart_create` (struct MPIsetup *)
- `void mpisetup_left_right` (struct MPIsetup *)
- `int mpisetup_check_rin_bndry` (struct MPIsetup *)
- `int mpisetup_check_rout_bndry` (struct MPIsetup *)
- `int mpisetup_check_zbot_bndry` (struct MPIsetup *)
- `int mpisetup_check_ztop_bndry` (struct MPIsetup *)
- `int mpisetup_MyProc` (struct MPIsetup *)
- `int mpisetup_NumProcs` (struct MPIsetup *)
- `int * mpisetup_dim_MyProc` (struct MPIsetup *)
- `int * mpisetup_dim_NumProcs` (struct MPIsetup *)
- `int * mpisetup_left_Proc` (struct MPIsetup *)
- `int * mpisetup_right_Proc` (struct MPIsetup *)

2.30.1 Function Documentation

2.30.1.1 `void mpisetup_cart_create (struct MPIsetup *)`

Definition at line 28 of file `mpisetup_routines.c`.

2.30.1.2 `int mpisetup_check_rin_bndry (struct MPIsetup *)`

Definition at line 52 of file `mpisetup_routines.c`.

2.30.1.3 `int mpisetup_check_rout_bndry (struct MPIsetup *)`

Definition at line 55 of file `mpisetup_routines.c`.

2.30.1.4 `int mpisetup_check_zbot_bndry (struct MPIsetup *)`

Definition at line 58 of file `mpisetup_routines.c`.

2.30.1.5 `int mpisetup_check_ztop_bndry (struct MPIsetup *)`

Definition at line 61 of file `mpisetup_routines.c`.

2.30.1.6 `struct MPIsetup* mpisetup_create (int , char **)` [read]

Definition at line 7 of file `mpisetup_create_destroy.c`.

2.30.1.7 `void mpisetup_destroy (struct MPIsetup *)`

Definition at line 17 of file `mpisetup_create_destroy.c`.

2.30.1.8 `int* mpisetup_dim.MyProc (struct MPIsetup *)`

Definition at line 70 of file `mpisetup_routines.c`.

2.30.1.9 `int* mpisetup_dim.NumProcs (struct MPIsetup *)`

Definition at line 73 of file `mpisetup_routines.c`.

2.30.1.10 `int* mpisetup_left.Proc (struct MPIsetup *)`

Definition at line 76 of file `mpisetup_routines.c`.

2.30.1.11 `void mpisetup_left_right (struct MPIsetup *)`

Definition at line 36 of file `mpisetup_routines.c`.

2.30.1.12 `int mpisetup.MyProc (struct MPIsetup *)`

Definition at line 64 of file `mpisetup_routines.c`.

2.30.1.13 `int mpisetup.NumProcs (struct MPIsetup *)`

Definition at line 67 of file `mpisetup_routines.c`.

2.30.1.14 `int* mpisetup_right.Proc (struct MPIsetup *)`

Definition at line 79 of file `mpisetup_routines.c`.

2.30.1.15 `void mpisetup_setprocs (struct MPIsetup *)`

Definition at line 7 of file `mpisetup_routines.c`.

2.31 src/Headers/Riemann.h File Reference

Functions

- `struct Riemann * riemann_create (struct Grid *)`

- void [riemann_destroy](#) (struct Riemann *)
- void [riemann_set_primL](#) (struct Riemann *theRiemann, int, double)
- void [riemann_set_primR](#) (struct Riemann *theRiemann, int, double)
- void [riemann_set_vel](#) (struct Riemann *, double *, double, double *, double, double)
- void [riemann_set_state](#) (struct Riemann *theRiemann, int)
- void [riemann_set_Ustar](#) (struct Riemann *, double *, double, double *, double)
- double * [riemann_Uk](#) (struct Riemann *)
- double * [riemann_Ustar](#) (struct Riemann *)
- void [riemann_addto_flux_general](#) (struct Riemann *, double, int)
- void [riemann_set_flux](#) (struct Riemann *, double, double *, double, double)
- double * [riemann_prim](#) (struct Riemann *, int)
- int [riemann_state](#) (struct Riemann *)
- double * [riemann_F](#) (struct Riemann *)
- double [riemann_Ss](#) (struct Riemann *)
- void [riemann_driver](#) (struct Cell *, struct Cell *, struct Grid *, double, double, double, double, double, double, double, int)

2.31.1 Function Documentation

2.31.1.1 void [riemann_addto_flux_general](#) (struct Riemann *, double , int)

Definition at line 279 of file [Riemann_routines.c](#).

2.31.1.2 struct Riemann* [riemann.create](#) (struct Grid *) [read]

Definition at line 9 of file [Riemann_create_destroy.c](#).

2.31.1.3 void [riemann_destroy](#) (struct Riemann *)

Definition at line 27 of file [Riemann_create_destroy.c](#).

2.31.1.4 void [riemann_driver](#) (struct Cell *, struct Cell *, struct Grid *, double , double , double , double , double , double , double , int)

Definition at line 322 of file [Riemann_routines.c](#).

2.31.1.5 double* [riemann_F](#) (struct Riemann *)

Definition at line 311 of file [Riemann_routines.c](#).

2.31.1.6 double* [riemann_prim](#) (struct Riemann * , int)

Definition at line 303 of file [Riemann_routines.c](#).

2.31.1.7 void [riemann_set_flux](#) (struct Riemann * , double , double * , double , double)

Definition at line 230 of file [Riemann_routines.c](#).

2.31.1.8 void [riemann_set_primL](#) (struct Riemann * *theRiemann*, int , double)

Definition at line 10 of file [Riemann_routines.c](#).

2.31.1.9 void riemann_set_primR (struct Riemann * *theRiemann*, int , double)

Definition at line 13 of file Riemann_routines.c.

2.31.1.10 void riemann_set_state (struct Riemann * *theRiemann*, int)

Definition at line 140 of file Riemann_routines.c.

2.31.1.11 void riemann_set_Ustar (struct Riemann * , double * , double , double * , double)

Definition at line 155 of file Riemann_routines.c.

2.31.1.12 void riemann_set_vel (struct Riemann * , double * , double , double * , double , double)

Definition at line 16 of file Riemann_routines.c.

2.31.1.13 double riemann_Ss (struct Riemann *)

Definition at line 318 of file Riemann_routines.c.

2.31.1.14 int riemann_state (struct Riemann *)

Definition at line 315 of file Riemann_routines.c.

2.31.1.15 double* riemann_Uk (struct Riemann *)

Definition at line 294 of file Riemann_routines.c.

2.31.1.16 double* riemann_Ustar (struct Riemann *)

Definition at line 297 of file Riemann_routines.c.

2.32 src/Headers/TimeStep.h File Reference

Functions

- struct TimeStep * [timestep_create](#) ()
- void [timestep_destroy](#) (struct TimeStep *)
- void [timestep_set_dt](#) (struct TimeStep *, struct Cell ***, struct Grid *)
- void [timestep_update_t](#) (struct TimeStep *)
- void [timestep_set_RK](#) (struct TimeStep *, double)
- void [timestep_substep](#) (struct TimeStep *, struct Cell ***, struct Grid *, struct GravMass *, struct MPIsetup *, double)
- void [timestep_update_Psi](#) (struct TimeStep *, struct Cell ***, struct Grid *, struct MPIsetup *)
- double [timestep_get_t](#) (struct TimeStep *)
- double [timestep_get_T_MAX](#) (struct TimeStep *)
- double [timestep_NUM_CHECKPOINTS](#) (struct TimeStep *)
- int * [timestep_nri](#) (struct TimeStep *)
- int * [timestep_nzk](#) (struct TimeStep *)
- void [timestep_set_Nfr](#) (struct TimeStep *, struct Grid *)

- void [timestep_set_Nfz](#) (struct TimeStep *, struct Grid *)
- int [timestep_Nfr](#) (struct TimeStep *)
- int [timestep_Nfz](#) (struct TimeStep *)

2.32.1 Function Documentation

2.32.1.1 **struct TimeStep*** [timestep_create](#) () [read]

2.32.1.2 **void** [timestep_destroy](#) (struct TimeStep *)

Definition at line 17 of file timestep_create_destroy.c.

2.32.1.3 **double** [timestep_get_t](#) (struct TimeStep *)

Definition at line 29 of file timestep_routines.c.

2.32.1.4 **double** [timestep_get_T_MAX](#) (struct TimeStep *)

2.32.1.5 **int** [timestep_Nfr](#) (struct TimeStep *)

Definition at line 164 of file timestep_routines.c.

2.32.1.6 **int** [timestep_Nfz](#) (struct TimeStep *)

Definition at line 167 of file timestep_routines.c.

2.32.1.7 **int*** [timestep_nri](#) (struct TimeStep *)

Definition at line 150 of file timestep_routines.c.

2.32.1.8 **double** [timestep_NUM_CHECKPOINTS](#) (struct TimeStep *)

2.32.1.9 **int*** [timestep_nzk](#) (struct TimeStep *)

Definition at line 153 of file timestep_routines.c.

2.32.1.10 **void** [timestep_set_dt](#) (struct TimeStep *, struct Cell ***, struct Grid *)

Definition at line 16 of file timestep_routines.c.

2.32.1.11 **void** [timestep_set_Nfr](#) (struct TimeStep *, struct Grid *)

Definition at line 156 of file timestep_routines.c.

2.32.1.12 **void** [timestep_set_Nfz](#) (struct TimeStep *, struct Grid *)

Definition at line 160 of file timestep_routines.c.

2.32.1.13 void timestep_set_RK (struct TimeStep *, double)

Definition at line 26 of file timestep_routines.c.

2.32.1.14 void timestep_substep (struct TimeStep *, struct Cell ***, struct Grid *, struct GravMass *, struct MPIsetup *, double)

Definition at line 34 of file timestep_routines.c.

2.32.1.15 void timestep_update_Psi (struct TimeStep *, struct Cell ***, struct Grid *, struct MPIsetup *)

Definition at line 124 of file timestep_routines.c.

2.32.1.16 void timestep_update_t (struct TimeStep *)

Definition at line 23 of file timestep_routines.c.

2.33 src/IO/io_create_destroy.c File Reference

```
#include <string.h>
#include <stdlib.h>
#include "../Headers/Grid.h"
#include "../Headers/Cell.h"
#include "hdf5.h"
#include "../Headers/IO.h"
#include "../Headers/header.h"
```

Macros

- `#define IO_PRIVATE_DEFS`
- `#define H5FILE_NAME "testout.h5"`
- `#define DATASETNAME "DoubleArray"`
- `#define RANK 2`

Functions

- struct IO * `io_create` (struct Grid *theGrid)
- void `io_destroy` (struct IO *theIO, struct Grid *theGrid)

2.33.1 Macro Definition Documentation

2.33.1.1 `#define DATASETNAME "DoubleArray"`

Definition at line 3 of file io_create_destroy.c.

2.33.1.2 `#define H5FILE_NAME "testout.h5"`

Definition at line 2 of file io_create_destroy.c.

2.33.1.3 #define IO_PRIVATE_DEFS

Definition at line 1 of file io_create_destroy.c.

2.33.1.4 #define RANK 2

Definition at line 4 of file io_create_destroy.c.

2.33.2 Function Documentation

2.33.2.1 struct IO* io_create (struct Grid * *theGrid*) [read]

Definition at line 14 of file io_create_destroy.c.

2.33.2.2 void io_destroy (struct IO * *theIO*, struct Grid * *theGrid*)

Definition at line 32 of file io_create_destroy.c.

2.34 src/IO/io_flatten_unflatten.c File Reference

```
#include <string.h>
#include <stdlib.h>
#include "../Headers/Grid.h"
#include "../Headers/Cell.h"
#include "hdf5.h"
#include "../Headers/IO.h"
#include "../Headers/header.h"
```

Macros

- #define [IO_PRIVATE_DEFS](#)
- #define [H5FILE_NAME](#) "testout.h5"
- #define [DATASETNAME](#) "DoubleArray"
- #define [RANK](#) 2

Functions

- void [io_flattened_prim](#) (struct IO *io_pointer, struct Cell ***theCells, struct Grid *theGrid)
- void [io_unflattened_prim](#) (struct IO *io_pointer, struct Cell ***theCells, struct Grid *theGrid)

2.34.1 Macro Definition Documentation

2.34.1.1 #define DATASETNAME "DoubleArray"

Definition at line 3 of file io_flatten_unflatten.c.

2.34.1.2 #define H5FILE_NAME "testout.h5"

Definition at line 2 of file io_flatten_unflatten.c.

2.34.1.3 `#define IO_PRIVATE_DEFS`

Definition at line 1 of file `io_flatten_unflatten.c`.

2.34.1.4 `#define RANK 2`

Definition at line 4 of file `io_flatten_unflatten.c`.

2.34.2 Function Documentation

2.34.2.1 `void io_flattened_prim (struct IO * io_pointer, struct Cell *** theCells, struct Grid * theGrid)`

Definition at line 14 of file `io_flatten_unflatten.c`.

2.34.2.2 `void io_unflattened_prim (struct IO * io_pointer, struct Cell *** theCells, struct Grid * theGrid)`

Definition at line 35 of file `io_flatten_unflatten.c`.

2.35 src/IO/io_hdf5.c File Reference

```
#include <string.h>
#include <stdlib.h>
#include "../Headers/Grid.h"
#include "../Headers/Cell.h"
#include "hdf5.h"
#include "../Headers/IO.h"
#include "../Headers/header.h"
```

Macros

- `#define IO_PRIVATE_DEFS`
- `#define H5FILE_NAME "testout.h5"`
- `#define DATASETNAME "DoubleArray"`
- `#define RANK 2`

Functions

- `void io_hdf5_out (struct IO *io_pointer, struct Grid *theGrid, char *output_filename)`
- `void io_hdf5_in (struct IO *io_pointer, struct Grid *theGrid, char *input_filename)`

2.35.1 Macro Definition Documentation

2.35.1.1 `#define DATASETNAME "DoubleArray"`

Definition at line 3 of file `io_hdf5.c`.

2.35.1.2 `#define H5FILE_NAME "testout.h5"`

Definition at line 2 of file `io_hdf5.c`.

2.35.1.3 `#define IO_PRIVATE_DEFS`

Definition at line 1 of file `io_hdf5.c`.

2.35.1.4 `#define RANK 2`

Definition at line 4 of file `io_hdf5.c`.

2.35.2 Function Documentation

2.35.2.1 `void io_hdf5_in (struct IO * io_pointer, struct Grid * theGrid, char * input_filename)`

Definition at line 87 of file `io_hdf5.c`.

2.35.2.2 `void io_hdf5_out (struct IO * io_pointer, struct Grid * theGrid, char * output_filename)`

Definition at line 14 of file `io_hdf5.c`.

2.36 `src/main.c` File Reference

```
#include <stdio.h>
#include <stdlib.h>
#include "Headers/MPIsetup.h"
#include "Headers/Cell.h"
#include "Headers/Grid.h"
#include "Headers/Face.h"
#include "Headers/GravMass.h"
#include "Headers/IO.h"
#include "Headers/TimeStep.h"
#include "Headers/header.h"
```

Functions

- `int main (int argc, char **argv)`

2.36.1 Function Documentation

2.36.1.1 `int main (int argc, char ** argv)`

Definition at line 54 of file `main.c`.

2.37 `src/MPIsetup/mpisetup_create_destroy.c` File Reference

```
#include <stdlib.h>
#include <stdio.h>
#include "../Headers/MPIsetup.h"
#include "../Headers/header.h"
```


Macros

- `#define MPISETUP_PRIVATE_DEFS`

Functions

- `struct MPIsetup * mpisetup_create` (int argc, char **argv)
- `void mpisetup_destroy` (struct MPIsetup *theMPIsetup)

2.37.1 Macro Definition Documentation

2.37.1.1 `#define MPISETUP_PRIVATE_DEFS`

Definition at line 1 of file mpisetup_create_destroy.c.

2.37.2 Function Documentation

2.37.2.1 `struct MPIsetup* mpisetup_create (int argc, char ** argv)` [read]

Definition at line 7 of file mpisetup_create_destroy.c.

2.37.2.2 `void mpisetup_destroy (struct MPIsetup * theMPIsetup)`

Definition at line 17 of file mpisetup_create_destroy.c.

2.38 src/MPIsetup/mpisetup_routines.c File Reference

```
#include <stdlib.h>
#include <stdio.h>
#include "../Headers/MPIsetup.h"
#include "../Headers/header.h"
```

Macros

- `#define MPISETUP_PRIVATE_DEFS`

Functions

- `void mpisetup_setprocs` (struct MPIsetup *theMPIsetup)
- `void mpisetup_cart_create` (struct MPIsetup *theMPIsetup)
- `void mpisetup_left_right` (struct MPIsetup *theMPIsetup)
- `int mpisetup_check_rin_bndry` (struct MPIsetup *theMPIsetup)
- `int mpisetup_check_rout_bndry` (struct MPIsetup *theMPIsetup)
- `int mpisetup_check_zbot_bndry` (struct MPIsetup *theMPIsetup)
- `int mpisetup_check_ztop_bndry` (struct MPIsetup *theMPIsetup)
- `int mpisetup_MyProc` (struct MPIsetup *theMPIsetup)
- `int mpisetup_NumProcs` (struct MPIsetup *theMPIsetup)
- `int * mpisetup_dim_MyProc` (struct MPIsetup *theMPIsetup)
- `int * mpisetup_dim_NumProcs` (struct MPIsetup *theMPIsetup)
- `int * mpisetup_left_Proc` (struct MPIsetup *theMPIsetup)
- `int * mpisetup_right_Proc` (struct MPIsetup *theMPIsetup)

2.38.1 Macro Definition Documentation

2.38.1.1 `#define MPISETUP_PRIVATE_DEFS`

Definition at line 1 of file `mpisetup_routines.c`.

2.38.2 Function Documentation

2.38.2.1 `void mpisetup_cart_create (struct MPIsetup * theMPIsetup)`

Definition at line 28 of file `mpisetup_routines.c`.

2.38.2.2 `int mpisetup_check_rin_bndry (struct MPIsetup * theMPIsetup)`

Definition at line 52 of file `mpisetup_routines.c`.

2.38.2.3 `int mpisetup_check_rout_bndry (struct MPIsetup * theMPIsetup)`

Definition at line 55 of file `mpisetup_routines.c`.

2.38.2.4 `int mpisetup_check_zbot_bndry (struct MPIsetup * theMPIsetup)`

Definition at line 58 of file `mpisetup_routines.c`.

2.38.2.5 `int mpisetup_check_ztop_bndry (struct MPIsetup * theMPIsetup)`

Definition at line 61 of file `mpisetup_routines.c`.

2.38.2.6 `int* mpisetup_dim_MyProc (struct MPIsetup * theMPIsetup)`

Definition at line 70 of file `mpisetup_routines.c`.

2.38.2.7 `int* mpisetup_dim_NumProcs (struct MPIsetup * theMPIsetup)`

Definition at line 73 of file `mpisetup_routines.c`.

2.38.2.8 `int* mpisetup_left_Proc (struct MPIsetup * theMPIsetup)`

Definition at line 76 of file `mpisetup_routines.c`.

2.38.2.9 `void mpisetup_left_right (struct MPIsetup * theMPIsetup)`

Definition at line 36 of file `mpisetup_routines.c`.

2.38.2.10 `int mpisetup_MyProc (struct MPIsetup * theMPIsetup)`

Definition at line 64 of file `mpisetup_routines.c`.

2.38.2.11 `int mpisetup_NumProcs (struct MPIsetup * theMPIsetup)`

Definition at line 67 of file `mpisetup_routines.c`.

2.38.2.12 `int* mpisetup_right_Proc (struct MPIsetup * theMPIsetup)`

Definition at line 79 of file `mpisetup_routines.c`.

2.38.2.13 `void mpisetup_setprocs (struct MPIsetup * theMPIsetup)`

Definition at line 7 of file `mpisetup_routines.c`.

2.39 src/Riemann/Riemann_create_destroy.c File Reference

```
#include <stdlib.h>
#include <stdio.h>
#include <math.h>
#include "../Headers/Grid.h"
#include "../Headers/Riemann.h"
#include "../Headers/header.h"
```

Macros

- `#define RIEMANN_PRIVATE_DEFS`

Functions

- `struct Riemann * riemann_create (struct Grid *theGrid)`
- `void riemann_destroy (struct Riemann *theRiemann)`

2.39.1 Macro Definition Documentation

2.39.1.1 `#define RIEMANN_PRIVATE_DEFS`

Definition at line 1 of file `Riemann_create_destroy.c`.

2.39.2 Function Documentation

2.39.2.1 `struct Riemann* riemann_create (struct Grid * theGrid)` [`read`]

Definition at line 9 of file `Riemann_create_destroy.c`.

2.39.2.2 `void riemann_destroy (struct Riemann * theRiemann)`

Definition at line 27 of file `Riemann_create_destroy.c`.

2.40 src/Riemann/Riemann_routines.c File Reference

```
#include <stdlib.h>
#include <stdio.h>
#include <math.h>
#include "../Headers/Riemann.h"
#include "../Headers/Grid.h"
#include "../Headers/Cell.h"
#include "../Headers/header.h"
```

Macros

- `#define RIEMANN_PRIVATE_DEFS`

Functions

- void [riemann_set_primL](#) (struct Riemann *theRiemann, int q, double input)
- void [riemann_set_primR](#) (struct Riemann *theRiemann, int q, double input)
- void [riemann_set_vel](#) (struct Riemann *theRiemann, double *n, double r, double *Bpack, double GAMMALAW, double DIVB_CH)
- void [riemann_set_state](#) (struct Riemann *theRiemann, int w)
- void [riemann_set_Ustar](#) (struct Riemann *theRiemann, double *n, double r, double *Bpack, double GAMMALAW)
- void [riemann_set_flux](#) (struct Riemann *theRiemann, double r, double *n, double GAMMALAW, double DIVB_CH)
- void [riemann_addto_flux_general](#) (struct Riemann *theRiemann, double w, int NUM_Q)
- double * [riemann_Uk](#) (struct Riemann *theRiemann)
- double * [riemann_Ustar](#) (struct Riemann *theRiemann)
- double * [riemann_prim](#) (struct Riemann *theRiemann, int state)
- double * [riemann_F](#) (struct Riemann *theRiemann)
- int [riemann_state](#) (struct Riemann *theRiemann)
- double [riemann_Ss](#) (struct Riemann *theRiemann)
- void [riemann_driver](#) (struct Cell *cL, struct Cell *cR, struct Grid *theGrid, double dA, double dt, double r, double deltaL, double deltaR, double dpL, double dpR, int direction)

2.40.1 Macro Definition Documentation

2.40.1.1 `#define RIEMANN_PRIVATE_DEFS`

Definition at line 1 of file Riemann_routines.c.

2.40.2 Function Documentation

2.40.2.1 void [riemann_addto_flux_general](#) (struct Riemann * *theRiemann*, double *w*, int *NUM_Q*)

Definition at line 279 of file Riemann_routines.c.

2.40.2.2 void [riemann_driver](#) (struct Cell * *cL*, struct Cell * *cR*, struct Grid * *theGrid*, double *dA*, double *dt*, double *r*, double *deltaL*, double *deltaR*, double *dpL*, double *dpR*, int *direction*)

Definition at line 322 of file Riemann_routines.c.

2.40.2.3 `double* riemann_F (struct Riemann * theRiemann)`

Definition at line 311 of file Riemann_routines.c.

2.40.2.4 `double* riemann_prim (struct Riemann * theRiemann, int state)`

Definition at line 303 of file Riemann_routines.c.

2.40.2.5 `void riemann_set_flux (struct Riemann * theRiemann, double r, double * n, double GAMMALAW, double DIVB_CH)`

Definition at line 230 of file Riemann_routines.c.

2.40.2.6 `void riemann_set_primL (struct Riemann * theRiemann, int q, double input)`

Definition at line 10 of file Riemann_routines.c.

2.40.2.7 `void riemann_set_primR (struct Riemann * theRiemann, int q, double input)`

Definition at line 13 of file Riemann_routines.c.

2.40.2.8 `void riemann_set_state (struct Riemann * theRiemann, int w)`

Definition at line 140 of file Riemann_routines.c.

2.40.2.9 `void riemann_set_Ustar (struct Riemann * theRiemann, double * n, double r, double * Bpack, double GAMMALAW)`

Definition at line 155 of file Riemann_routines.c.

2.40.2.10 `void riemann_set_vel (struct Riemann * theRiemann, double * n, double r, double * Bpack, double GAMMALAW, double DIVB_CH)`

Definition at line 16 of file Riemann_routines.c.

2.40.2.11 `double riemann_Ss (struct Riemann * theRiemann)`

Definition at line 318 of file Riemann_routines.c.

2.40.2.12 `int riemann_state (struct Riemann * theRiemann)`

Definition at line 315 of file Riemann_routines.c.

2.40.2.13 `double* riemann_Uk (struct Riemann * theRiemann)`

Definition at line 294 of file Riemann_routines.c.

2.40.2.14 `double* riemann_Ustar (struct Riemann * theRiemann)`

Definition at line 297 of file Riemann_routines.c.

2.41 src/TimeStep/timestep_create_destroy.c File Reference

```
#include <stdlib.h>
#include <stdio.h>
#include "../Headers/Grid.h"
#include "../Headers/TimeStep.h"
#include "../Headers/header.h"
```

Macros

- `#define` [TIMESTEP_PRIVATE_DEFS](#)

Functions

- `struct TimeStep *` [timestep_create](#) (`struct Grid *`*theGrid*)
- `void` [timestep_destroy](#) (`struct TimeStep *`*theTimeStep*)

2.41.1 Macro Definition Documentation

2.41.1.1 `#define` [TIMESTEP_PRIVATE_DEFS](#)

Definition at line 1 of file `timestep_create_destroy.c`.

2.41.2 Function Documentation

2.41.2.1 `struct TimeStep*` [timestep_create](#) (`struct Grid *` *theGrid*) [read]

Definition at line 8 of file `timestep_create_destroy.c`.

2.41.2.2 `void` [timestep_destroy](#) (`struct TimeStep *` *theTimeStep*)

Definition at line 17 of file `timestep_create_destroy.c`.

2.42 src/TimeStep/timestep_routines.c File Reference

```
#include <stdlib.h>
#include <stdio.h>
#include <math.h>
#include "../Headers/Cell.h"
#include "../Headers/TimeStep.h"
#include "../Headers/Riemann.h"
#include "../Headers/Grid.h"
#include "../Headers/GravMass.h"
#include "../Headers/Face.h"
#include "../Headers/MPIsetup.h"
#include "../Headers/header.h"
```

Macros

- `#define TIMESTEP_PRIVATE_DEFS`

Functions

- void `timestep_set_dt` (struct TimeStep *theTimeStep, struct Cell ***theCells, struct Grid *theGrid)
- void `timestep_update_t` (struct TimeStep *theTimeStep)
- void `timestep_set_RK` (struct TimeStep *theTimeStep, double RK)
- double `timestep_get_t` (struct TimeStep *theTimeStep)
- void `timestep_substep` (struct TimeStep *theTimeStep, struct Cell ***theCells, struct Grid *theGrid, struct GravMass *theGravMasses, struct MPIsetup *theMPIsetup, double timestep_fac)
- void `timestep_update_Psi` (struct TimeStep *theTimeStep, struct Cell ***theCells, struct Grid *theGrid, struct MPIsetup *theMPIsetup)
- int * `timestep_nri` (struct TimeStep *theTimeStep)
- int * `timestep_nzk` (struct TimeStep *theTimeStep)
- void `timestep_set_Nfr` (struct TimeStep *theTimeStep, struct Grid *theGrid)
- void `timestep_set_Nfz` (struct TimeStep *theTimeStep, struct Grid *theGrid)
- int `timestep_Nfr` (struct TimeStep *theTimeStep)
- int `timestep_Nfz` (struct TimeStep *theTimeStep)

2.42.1 Macro Definition Documentation

2.42.1.1 `#define TIMESTEP_PRIVATE_DEFS`

Definition at line 1 of file timestep_routines.c.

2.42.2 Function Documentation

2.42.2.1 `double timestep_get_t (struct TimeStep * theTimeStep)`

Definition at line 29 of file timestep_routines.c.

2.42.2.2 `int timestep_Nfr (struct TimeStep * theTimeStep)`

Definition at line 164 of file timestep_routines.c.

2.42.2.3 `int timestep_Nfz (struct TimeStep * theTimeStep)`

Definition at line 167 of file timestep_routines.c.

2.42.2.4 `int* timestep_nri (struct TimeStep * theTimeStep)`

Definition at line 150 of file timestep_routines.c.

2.42.2.5 `int* timestep_nzk (struct TimeStep * theTimeStep)`

Definition at line 153 of file timestep_routines.c.

2.42.2.6 `void timestep_set_dt (struct TimeStep * theTimeStep, struct Cell *** theCells, struct Grid * theGrid)`

Definition at line 16 of file timestep_routines.c.

2.42.2.7 void timestep_set_Nfr (struct TimeStep * *theTimeStep*, struct Grid * *theGrid*)

Definition at line 156 of file timestep_routines.c.

2.42.2.8 void timestep_set_Nfz (struct TimeStep * *theTimeStep*, struct Grid * *theGrid*)

Definition at line 160 of file timestep_routines.c.

2.42.2.9 void timestep_set_RK (struct TimeStep * *theTimeStep*, double *RK*)

Definition at line 26 of file timestep_routines.c.

2.42.2.10 void timestep_substep (struct TimeStep * *theTimeStep*, struct Cell *** *theCells*, struct Grid * *theGrid*, struct GravMass * *theGravMasses*, struct MPIsetup * *theMPIsetup*, double *timestep_fac*)

Definition at line 34 of file timestep_routines.c.

2.42.2.11 void timestep_update_Psi (struct TimeStep * *theTimeStep*, struct Cell *** *theCells*, struct Grid * *theGrid*, struct MPIsetup * *theMPIsetup*)

Definition at line 124 of file timestep_routines.c.

2.42.2.12 void timestep_update_t (struct TimeStep * *theTimeStep*)

Definition at line 23 of file timestep_routines.c.

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