

source\_dust

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# Chapter 1

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## Chapter 2

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## Chapter 3

# Data Structure Documentation

### 3.1 condsq Struct Reference

```
#include <const.h>
```

#### Data Fields

- double [x1](#)
- double [x2](#)
- double [x3](#)
- double [x4](#)
- double [y1](#)
- double [y2](#)
- double [y3](#)
- double [y4](#)
- int [in1](#)
- int [in2](#)
- int [in3](#)
- int [in4](#)

#### 3.1.1 Detailed Description

Definition at line 332 of file const.h.

#### 3.1.2 Field Documentation

##### 3.1.2.1 int in1

Definition at line 336 of file const.h.

##### 3.1.2.2 int in2

Definition at line 336 of file const.h.

##### 3.1.2.3 int in3

Definition at line 336 of file const.h.

#### 3.1.2.4 int in4

Definition at line 336 of file const.h.

#### 3.1.2.5 double x1

Definition at line 334 of file const.h.

#### 3.1.2.6 double x2

Definition at line 334 of file const.h.

#### 3.1.2.7 double x3

Definition at line 334 of file const.h.

#### 3.1.2.8 double x4

Definition at line 334 of file const.h.

#### 3.1.2.9 double y1

Definition at line 335 of file const.h.

#### 3.1.2.10 double y2

Definition at line 335 of file const.h.

#### 3.1.2.11 double y3

Definition at line 335 of file const.h.

#### 3.1.2.12 double y4

Definition at line 335 of file const.h.

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

- [src/const.h](#)

## 3.2 d\_particle Struct Reference

```
#include <const.h>
```

### Data Fields

- double [x](#)
- double [y](#)
- double [z](#)
- int [spec](#)



- double [q](#)
- double [icnt](#)
- double [ecnt](#)
- double [bcnt](#)

### 3.2.1 Detailed Description

Definition at line 109 of file const.h.

### 3.2.2 Field Documentation

#### 3.2.2.1 double bcnt

Definition at line 118 of file const.h.

#### 3.2.2.2 double ecnt

Definition at line 117 of file const.h.

#### 3.2.2.3 double icnt

Definition at line 116 of file const.h.

#### 3.2.2.4 double q

Definition at line 115 of file const.h.

#### 3.2.2.5 int spec

Definition at line 114 of file const.h.

#### 3.2.2.6 double x

Definition at line 111 of file const.h.

#### 3.2.2.7 double y

Definition at line 112 of file const.h.

#### 3.2.2.8 double z

Definition at line 113 of file const.h.

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

- [src/const.h](#)

## 3.3 d\_rho Struct Reference

```
#include <const.h>
```

## Data Fields

- double [x](#)
- double [y](#)
- double [rho](#)
- double [rho\\_av](#)

### 3.3.1 Detailed Description

Definition at line 353 of file const.h.

### 3.3.2 Field Documentation

#### 3.3.2.1 double rho

Definition at line 357 of file const.h.

#### 3.3.2.2 double rho\_av

Definition at line 358 of file const.h.

#### 3.3.2.3 double x

Definition at line 355 of file const.h.

#### 3.3.2.4 double y

Definition at line 356 of file const.h.

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

- [src/const.h](#)

## 3.4 dtriangle Struct Reference

```
#include <const.h>
```

## Data Fields

- int [pt1](#)
- int [pt2](#)
- int [pt3](#)
- double [tcx](#)
- double [tcy](#)
- double [area](#)
- double [mass](#)

### 3.4.1 Detailed Description

Definition at line 205 of file const.h.

### 3.4.2 Field Documentation

#### 3.4.2.1 double area

Definition at line 212 of file const.h.

#### 3.4.2.2 double mass

Definition at line 213 of file const.h.

#### 3.4.2.3 int pt1

Definition at line 207 of file const.h.

#### 3.4.2.4 int pt2

Definition at line 208 of file const.h.

#### 3.4.2.5 int pt3

Definition at line 209 of file const.h.

#### 3.4.2.6 double tcx

Definition at line 210 of file const.h.

#### 3.4.2.7 double tcy

Definition at line 211 of file const.h.

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

- [src/const.h](#)

## 3.5 particle Struct Reference

```
#include <const.h>
```

### Data Fields

- double [x](#)
- double [y](#)
- double [z](#)
- double [vx](#)
- double [vy](#)
- double [vz](#)
- double [kenenergy](#)
- int [llnext](#)

### 3.5.1 Detailed Description

Definition at line 96 of file const.h.

### 3.5.2 Field Documentation

#### 3.5.2.1 double kenergy

Definition at line 104 of file const.h.

#### 3.5.2.2 int llnext

Definition at line 105 of file const.h.

#### 3.5.2.3 double vx

Definition at line 101 of file const.h.

#### 3.5.2.4 double vy

Definition at line 102 of file const.h.

#### 3.5.2.5 double vz

Definition at line 103 of file const.h.

#### 3.5.2.6 double x

Definition at line 98 of file const.h.

#### 3.5.2.7 double y

Definition at line 99 of file const.h.

#### 3.5.2.8 double z

Definition at line 100 of file const.h.

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

- [src/const.h](#)

## 3.6 species Struct Reference

```
#include <const.h>
```

Collaboration diagram for species:

### Data Fields

- [particle part](#) [NPART\_MAX]

### 3.6.1 Detailed Description

Definition at line 122 of file const.h.

### 3.6.2 Field Documentation

#### 3.6.2.1 particle part[NPART\_MAX]

Definition at line 124 of file const.h.

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

- src/[const.h](#)

## 3.7 vectorst Struct Reference

```
#include <const.h>
```

### Data Fields

- double [x](#)
- double [y](#)

### 3.7.1 Detailed Description

Definition at line 343 of file const.h.

### 3.7.2 Field Documentation

#### 3.7.2.1 double x

Definition at line 345 of file const.h.

#### 3.7.2.2 double y

Definition at line 346 of file const.h.

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

- src/[const.h](#)



## Chapter 4

# File Documentation

### 4.1 src/accel.c File Reference

```
#include "const.h"
#include <math.h>
#include <stdlib.h>
Include dependency graph for accel.c:
```

### 4.2 src/collisions.c File Reference

```
#include <math.h>
#include "const.h"
Include dependency graph for collisions.c:
```

#### Functions

- void [collisions\\_init](#) (void)
- void [collisions](#) (void)
- double [findsigma](#) (int *i*, double *kinener*)
- void [collide](#) (int *i*, int *colltype*, int *j*, double *kener*, double *pvel*)

#### 4.2.1 Function Documentation

##### 4.2.1.1 void collide ( int *i*, int *colltype*, int *j*, double *kener*, double *pvel* )

Definition at line 244 of file collisions.c.

##### 4.2.1.2 void collisions ( void )

Definition at line 86 of file collisions.c.

##### 4.2.1.3 void collisions\_init ( void )

Definition at line 21 of file collisions.c.

#### 4.2.1.4 double findsigma ( int *i*, double *kinener* )

Definition at line 196 of file collisions.c.

### 4.3 src/collisions\_constant.c File Reference

```
#include <math.h>
#include "const.h"
Include dependency graph for collisions_constant.c:
```

#### Functions

- void [collisions\\_init](#) (void)
- void [collisions](#) (void)
- double [findsigma](#) (int *i*, double *kinener*)
- void [collide](#) (int *i*, int *colltype*, int *j*, double *kener*, double *pvel*)

#### 4.3.1 Function Documentation

##### 4.3.1.1 void collide ( int *i*, int *colltype*, int *j*, double *kener*, double *pvel* )

Definition at line 281 of file collisions\_constant.c.

##### 4.3.1.2 void collisions ( void )

Definition at line 91 of file collisions\_constant.c.

##### 4.3.1.3 void collisions\_init ( void )

Definition at line 22 of file collisions\_constant.c.

##### 4.3.1.4 double findsigma ( int *i*, double *kinener* )

Definition at line 233 of file collisions\_constant.c.

### 4.4 src/const.h File Reference

```
#include <stdio.h>
#include <stdlib.h>
#include <math.h>
#include <time.h>
#include "funct.h"
Include dependency graph for const.h: This graph shows which files directly or indirectly include this file:
```

#### Data Structures

- struct [particle](#)
- struct [d\\_particle](#)
- struct [species](#)



- struct [dtriangle](#)
- struct [condsq](#)
- struct [vectorst](#)
- struct [d\\_rho](#)

## Macros

- #define [EPS0](#) 8.854E-12 /\*epsilon zero,C^2/(N\*m^2)\*/
- #define [Mass\\_0](#) 9.1095E-31 /\*electron mass, kg\*/
- #define [Mass\\_1](#) 1.6726E-27 /\*proton mass, kg\*/
- #define [Q](#) 1.602189E-19 /\*elementary charge value, C\*/
- #define [Lx\\_MAX](#) 5 /\*Maximum dimensions in meters\*/
- #define [Ly\\_MAX](#) 5
- #define [Lz\\_MAX](#) 5
- #define [ngx\\_MAX](#) 1024 /\*Maximum number of grid points\*/
- #define [ngy\\_MAX](#) 1024
- #define [ngx\\_MAX](#) 1024
- #define [NPART\\_MAX](#) 5000000 /\*Max no. of particles,each [species](#) per process\*/
- #define [DIM](#) 3 /\*dimesnions\*/
- #define [NOF](#) 1 /\*no of forces E=1, E+B=2\*/
- #define [S](#) 2 /\*number of [species](#)\*/
- #define [electron](#) 0
- #define [ion](#) 1
- #define [beam](#) 2
- #define [GONE](#) -1
- #define [NORMAL](#) 0
- #define [BOUND](#) 1
- #define [PROBE](#) 2
- #define [D\\_INSU](#) 3
- #define [D\\_COND](#) 2
- #define [CONVTEST](#) 5
- #define [PRSEG](#) 4
- #define [CROSSFACTOR](#) 0.00001
- #define [LIST\\_SIZE](#) 15000
- #define [BUCKETSIZE](#) 1000
- #define [NGMAX](#) 15
- #define [NPRE](#) 2
- #define [NPOST](#) 3
- #define [NCYCLES](#) 2
- #define [POTPOTS](#) 101

## Typedefs

- typedef struct [particle](#) [particle](#)
- typedef struct [d\\_particle](#) [d\\_particle](#)
- typedef struct [species](#) [species](#)
- typedef struct [dtriangle](#) [dtriangle](#)
- typedef struct [condsq](#) [condsq](#)
- typedef struct [vectorst](#) [vectorst](#)
- typedef struct [d\\_rho](#) [d\\_rho](#)

## Variables

- double [TOLERANCE](#)
- double [tolfloating](#)
- double [dens](#) [S]
- double [debye](#) [S]
- double [debyetotal](#)
- double [omegap](#) [S]
- double [mass](#) [S]
- double [charge](#) [S]
- double [normalcharge](#) [S]
- double [tempx](#) [S]
- double [tempy](#) [S]
- double [tempz](#) [S]
- double [vthx](#) [S]
- double [vthy](#) [S]
- double [vthz](#) [S]
- long int [npart](#) [S]
- long int [npartinit](#) [S]
- double [vdriftx](#) [S]
- double [qm](#) [S]
- double [chargeandnorm](#) [S]
- double [ti2te](#)
- long int [lostpart](#) [S]
- long int [superfast](#)
- long int \*\* [current](#)
- long int \*\* [curr\\_av](#)
- long int \*\* [rcurr\\_av](#)
- double [vmean](#) [S]
- long int [allpart](#)
- double [ratio](#)
- [species spec](#) [S]
- long int [lostlist](#) [S][NPART\_MAX]
- long int [alllost](#)
- [d\\_particle](#) \*\* [dpart](#)
- [d\\_particle](#) \*\* [rdpart](#)
- double \*\* [dpartq](#)
- double \*\* [rdpartq](#)
- double \* [phi](#)
- double \* [phiav](#)
- double \* [PE](#)
- double \* [PEtotal](#)
- double \* [qdens](#)
- double \* [potconv](#) [CONVTEST]
- double \* [Fs](#)
- double \* [Bf](#)
- double \* [rho](#)
- double \* [pdens](#)
- double \* [KE](#)
- double \* [vxvec](#)
- double \* [vyvec](#)
- double \* [vzvec](#)
- double \* [rrho](#)
- double \* [rpdens](#)
- double \* [rKE](#)

- double \* [rvxvec](#)
- double \* [rvyvec](#)
- double \* [rvzvec](#)
- int [FsMAX](#)
- int [rhoMAX](#)
- int [pdensMAX](#)
- int [KEMAX](#)
- int [phiMAX](#)
- int [phiavMAX](#)
- int [PEMAX](#)
- int [qdensMAX](#)
- int [potconvMAX](#)
- int [PEtotalMAX](#)
- int [FsEy](#)
- int [rhoMAXhalf](#)
- int [pdens\\_off](#)
- int [KE\\_off](#)
- int [FsEz](#)
- int [PEMAXhalf](#)
- int [BfMAX](#)
- int [FsBy](#)
- int [FsBz](#)
- double [Lx](#)
- double [Ly](#)
- double [Lz](#)
- double [Gx](#)
- double [Gy](#)
- double [Gz](#)
- double [dt](#)
- double [tmax](#)
- double [dx](#)
- double [dy](#)
- double [dz](#)
- int [ngx](#)
- int [ngy](#)
- int [ngz](#)
- double [dxdt](#)
- double [dydt](#)
- double [dzdt](#)
- double [dtdx](#)
- double [dtdy](#)
- double [dtdz](#)
- double [dxdy](#)
- double [dV](#)
- double [dxdz](#)
- double [dxdydt](#)
- double [dVdt](#)
- double [normtime](#)
- double [normvel](#)
- double [normx](#)
- double [normpot](#)
- double [normcharge](#)
- double [normmass](#)
- double [normqm](#)
- double [normEfield](#)

- double [normdens](#)
- double [normqdens](#)
- double [normPE](#)
- double [cellvolume](#)
- double [normPP](#)
- int [probe\\_version](#)
- int [probex](#)
- int [probey](#)
- double [Vpr\\_begin](#)
- double [Vpr\\_end](#)
- double [Vpr\\_step](#)
- double [Vpr](#)
- double [probexmin](#)
- double [probexmax](#)
- double [probeymin](#)
- double [probeymax](#)
- int \* [vertp](#)
- double \* [ap](#)
- double \* [bp](#)
- double \* [x1p](#)
- double \* [maxx](#)
- double \* [minx](#)
- double \* [maxy](#)
- double \* [miny](#)
- int [probesegments](#)
- double \*\* [dustx](#)
- double \*\* [dusty](#)
- double \*\* [dustz](#)
- double \*\* [dusta](#)
- double \*\* [dustb](#)
- double \*\* [dustxdx](#)
- double \*\* [dustydy](#)
- double \*\* [dustzdz](#)
- double \*\* [dustbdy](#)
- double \*\* [dustq](#)
- double \*\* [dustxdxold](#)
- double \*\* [dustydyold](#)
- double \*\* [dustzdzold](#)
- int \*\* [dustv](#)
- double \* [dustcx](#)
- double \* [dustcy](#)
- double \* [dustcz](#)
- double \* [dustpcx](#)
- double \* [dustpcy](#)
- double \* [dustpcz](#)
- double \* [dustcxdx](#)
- double \* [dustcydx](#)
- double \* [dustczdx](#)
- int \* [ncorners](#)
- int \*\* [lut](#)
- int \* [dtype](#)
- int \* [dmove](#)
- int \* [dshape](#)
- double \* [dradius](#)
- double \* [dradiusdx](#)

- int \* [dnumber](#)
- int [noofdusts](#)
- double \* [dmass](#)
- double \* [dustrho](#)
- double \* [dmass\\_centr\\_y](#)
- double \* [dmass\\_centr\\_x](#)
- double \* [dmass\\_centr\\_z](#)
- double \* [dmoml](#)
- double \*\* [dr2v2](#)
- double \* [dphifl](#)
- [dtriangle](#) \*\* [dtrian](#)
- int \* [nooftriangles](#)
- long int \* [dpartlast](#)
- long int \* [dpartmax](#)
- double \* [dustvxc](#)
- double \* [dustvyc](#)
- double \* [dustvzc](#)
- double \* [dustaccx](#)
- double \* [dustaccy](#)
- double \* [dustaccz](#)
- double \* [duste](#)
- double \* [dustomega](#)
- double \*\* [dustvx](#)
- double \*\* [dustvy](#)
- double \*\* [dustvz](#)
- double \*\* [daa](#)
- double \*\* [dbb](#)
- double \*\* [dcc](#)
- double \*\* [daa1y](#)
- double \*\* [daa1x](#)
- double \*\* [dbb1y](#)
- double \*\* [dbb1x](#)
- double \*\* [dcc1y](#)
- double \*\* [dcc1x](#)
- double \* [dustworkfunct](#)
- double [flux](#) [S][6]
- double [fluxrest](#) [S][6]
- double [extrapart](#) [S][6]
- double [totalflux](#) [S]
- double [Vbound](#)
- double [llb](#) [S]
- double [lzet](#) [S]
- double [lv0](#) [S]
- double [rlb](#) [S]
- double [rzet](#) [S]
- double [rv0](#) [S]
- double [rvdriftx](#) [S]
- FILE \* [fp](#)
- FILE \* [fp2](#)
- FILE \* [curr](#)
- FILE \* [poten](#)
- FILE \* [potclr](#)
- FILE \* [pot2Dav](#)
- FILE \* [pot2Dclr](#)
- FILE \* [pot2D](#)

- FILE \* [efx](#)
- FILE \* [efy](#)
- FILE \* [efz](#)
- FILE \* [frho](#)
- FILE \* [idents](#)
- FILE \* [edens](#)
- FILE \* [bdens](#)
- FILE \* [epe](#)
- FILE \* [eke](#)
- FILE \* [ipe](#)
- FILE \* [ike](#)
- FILE \* [pe](#)
- FILE \* [pe\\_time](#)
- FILE \* [eke\\_time](#)
- FILE \* [ike\\_time](#)
- FILE \* [epe\\_time](#)
- FILE \* [ipe\\_time](#)
- FILE \* [dustcharge](#)
- FILE \* [dust\\_time](#)
- FILE \* [convergence](#)
- FILE \* [dhist](#)
- FILE \* [dustshape](#)
- FILE \* [eavvel](#)
- FILE \* [iavvel](#)
- FILE \* [evxphs](#)
- FILE \* [ivxphs](#)
- FILE \* [newprobe](#)
- int [numberofprints](#)
- double [weight](#)
- int [average](#)
- double [primerootbucket](#) [BUCKETSIZE]
- double [primerootno](#)
- double [sqrt\\_two](#)
- double [sqrt\\_pi](#)
- double [sqrt\\_twopi](#)
- double [pi](#)
- int [particlesno](#)
- int [takecut](#)
- FILE \* [dens\\_err](#)
- int [rank](#)
- int [numtasks](#)
- int [mpicheck](#)
- FILE \* [history](#)
- clock\_t [clockstart](#)
- clock\_t [clockend](#)
- time\_t [timestart](#)
- time\_t [timeending](#)
- double [timeelapsed](#)
- FILE \* [probes1](#)
- FILE \* [probes2](#)
- FILE \* [probes3](#)
- FILE \* [dustshapet](#)
- int [timerprobes](#)
- d\_particle \* [tmp\\_dpart](#)
- int [fmg\\_ng](#)

- int [fmg\\_nnx](#)
- int [fmg\\_nny](#)
- int [fmg\\_nnz](#)
- int [fmg\\_mingridx](#)
- int [fmg\\_mingridy](#)
- int [fmg\\_mingridz](#)
- double \*\*\* [ires](#) [[NGMAX](#)+1]
- double \*\*\* [irho](#) [[NGMAX](#)+1]
- double \*\*\* [irhs](#) [[NGMAX](#)+1]
- double \*\*\* [iu](#) [[NGMAX](#)+1]
- int [diagint](#)
- int \* [diagint\\_av](#)
- int \* [diagint\\_st](#)
- [condsq](#) \*\* [csq](#)
- [vectorst](#) \*\* [unitvec](#)
- [vectorst](#) \*\* [orthvec](#)
- [vectorst](#) \*\* [unitvecseg](#)
- [vectorst](#) \*\* [orthvecseg](#)
- int [cond\\_present](#)
- int [dustmove](#)
- [d\\_rho](#) \*\* [drho](#)
- double \* [rdrho](#)
- double \* [tordrho](#)
- int \* [drholast](#)
- int [rdrholast](#)
- double [ddelta](#)
- double [ddelta2](#)
- int \*\* [ccorner](#)
- int \*\* [vipcorner](#)
- int [photons](#)
- long int [ph\\_fluxprdt](#)
- double [ph\\_bmin](#)
- double [ph\\_bmax](#)
- double [ph\\_xmin](#)
- double [ph\\_xmax](#)
- double [ph\\_length](#)
- double [ph\\_a](#)
- int [ph\\_vert](#)
- double [ph\\_angle](#)
- double [ph\\_angle\\_rad](#)
- double [ph\\_flux](#)
- double [ph\\_energy](#)
- double [ph\\_cosangle](#)
- double [ph\\_sinangle](#)
- double \*\* [dustxnormv](#)
- double \*\* [dustynormv](#)
- FILE \* [force\\_chk](#)
- long int [c0](#) [[S](#)]
- long int [c1](#) [[S](#)]
- long int [c2](#) [[S](#)]
- long int [c3](#) [[S](#)]
- long int [c4](#) [[S](#)]
- long int [c5](#) [[S](#)]
- int \* [limesh](#)
- double \* [phi\\_nodust](#)

- double \* [Fs\\_nodust](#)
- int [lngx](#)
- int [lngy](#)
- int [lngz](#)
- double [lidx](#)
- double [ldy](#)
- double [ldz](#)
- long int [llsize](#)
- int \* [d\\_globalist](#)
- int \* [d\\_localmax](#)
- int \*\* [d\\_localist](#)
- FILE \* [testowy](#)
- double \* [drag\\_direct\\_x](#)
- double \* [drag\\_direct\\_y](#)
- double \* [drag\\_direct\\_z](#)
- double \* [drag\\_elect\\_x](#)
- double \* [drag\\_elect\\_y](#)
- double \* [drag\\_elect\\_z](#)
- double \* [drot\\_z\\_x1](#)
- double \* [drot\\_z\\_x2](#)
- double \* [drot\\_y\\_x1](#)
- double \* [drot\\_y\\_x2](#)
- double \* [drot\\_z\\_y1](#)
- double \* [drot\\_z\\_y2](#)
- double \* [drot\\_y\\_z1](#)
- double \* [drot\\_y\\_z2](#)
- double \* [drot\\_x\\_y1](#)
- double \* [drot\\_x\\_y2](#)
- double \* [drot\\_x\\_z1](#)
- double \* [drot\\_x\\_z2](#)
- double \* [elrot\\_z\\_x1](#)
- double \* [elrot\\_z\\_x2](#)
- double \* [elrot\\_y\\_x1](#)
- double \* [elrot\\_y\\_x2](#)
- double \* [elrot\\_z\\_y1](#)
- double \* [elrot\\_z\\_y2](#)
- double \* [elrot\\_y\\_z1](#)
- double \* [elrot\\_y\\_z2](#)
- double \* [elrot\\_x\\_y1](#)
- double \* [elrot\\_x\\_y2](#)
- double \* [elrot\\_x\\_z1](#)
- double \* [elrot\\_x\\_z2](#)
- double [nullcoll](#) [S]
- double [nullcollrest](#) [S]
- double [nullcollfreq](#) [S]
- double [massneutrals](#)
- double [vthneutr](#)
- double [ndensity](#)
- double \* [sigma](#)
- int [colltypes](#) [S]
- double \* [ptemp11](#)
- double \* [ptemp12](#)
- double \* [ptemp13](#)
- double \* [ptemp14](#)
- double \* [ptemp15](#)



- double \* [ptemp16](#)
- double \* [ptemp17](#)
- double \* [ptemp18](#)
- double \* [ptemp19](#)
- double \* [ptemp21](#)
- double \* [ptemp22](#)
- double \* [ptemp23](#)
- double \* [ptemp24](#)
- double \* [ptemp25](#)
- double \* [ptemp26](#)
- double \* [ptemp27](#)
- double \* [ptemp28](#)
- double \* [ptemp29](#)
- double \* [ptemp31](#)
- double \* [ptemp32](#)
- double \* [ptemp33](#)
- double \* [ptemp34](#)
- double \* [ptemp35](#)
- double \* [ptemp36](#)
- double \* [ptemp37](#)
- double \* [ptemp38](#)
- double \* [ptemp39](#)
- FILE \* [probes11](#)
- FILE \* [probes12](#)
- FILE \* [probes13](#)
- FILE \* [probes14](#)
- FILE \* [probes15](#)
- FILE \* [probes16](#)
- FILE \* [probes17](#)
- FILE \* [probes18](#)
- FILE \* [probes19](#)
- FILE \* [probes21](#)
- FILE \* [probes22](#)
- FILE \* [probes23](#)
- FILE \* [probes24](#)
- FILE \* [probes25](#)
- FILE \* [probes26](#)
- FILE \* [probes27](#)
- FILE \* [probes28](#)
- FILE \* [probes29](#)
- FILE \* [probes31](#)
- FILE \* [probes32](#)
- FILE \* [probes33](#)
- FILE \* [probes34](#)
- FILE \* [probes35](#)
- FILE \* [probes36](#)
- FILE \* [probes37](#)
- FILE \* [probes38](#)
- FILE \* [probes39](#)
- FILE \* [potdistr](#)
- double [potdistrmax](#)
- double [potdistrmin](#)
- int [potdistrarray](#) [[POTPOTS](#)]

#### 4.4.1 Macro Definition Documentation

##### 4.4.1.1 `#define beam 2`

Definition at line 45 of file const.h.

##### 4.4.1.2 `#define BOUND 1`

Definition at line 50 of file const.h.

##### 4.4.1.3 `#define BUCKETSIZE 1000`

Definition at line 279 of file const.h.

##### 4.4.1.4 `#define CONVTEST 5`

Definition at line 56 of file const.h.

##### 4.4.1.5 `#define CROSSFACTOR 0.00001`

Definition at line 58 of file const.h.

##### 4.4.1.6 `#define D_COND 2`

Definition at line 54 of file const.h.

##### 4.4.1.7 `#define D_INSU 3`

Definition at line 53 of file const.h.

##### 4.4.1.8 `#define DIM 3 /*dimesnions*/`

Definition at line 33 of file const.h.

##### 4.4.1.9 `#define electron 0`

Definition at line 43 of file const.h.

##### 4.4.1.10 `#define EPS0 8.854E-12 /*epsilon zero,C^2/(N*m^2)*/`

Definition at line 18 of file const.h.

##### 4.4.1.11 `#define GONE -1`

Definition at line 46 of file const.h.

##### 4.4.1.12 `#define ion 1`

Definition at line 44 of file const.h.

**4.4.1.13 #define LIST\_SIZE 15000**

Definition at line 60 of file const.h.

**4.4.1.14 #define Lx\_MAX 5 /\*Maximum dimensions in meters\*/**

Definition at line 23 of file const.h.

**4.4.1.15 #define Ly\_MAX 5**

Definition at line 24 of file const.h.

**4.4.1.16 #define Lz\_MAX 5**

Definition at line 25 of file const.h.

**4.4.1.17 #define Mass\_0 9.1095E-31 /\*electron mass, kg\*/**

Definition at line 19 of file const.h.

**4.4.1.18 #define Mass\_1 1.6726E-27 /\*proton mass, kg\*/**

Definition at line 20 of file const.h.

**4.4.1.19 #define NCYCLES 2**

Definition at line 325 of file const.h.

**4.4.1.20 #define NGMAX 15**

Definition at line 322 of file const.h.

**4.4.1.21 #define ngx\_MAX 1024 /\*Maximum number of grid points\*/**

Definition at line 27 of file const.h.

**4.4.1.22 #define ngy\_MAX 1024**

Definition at line 28 of file const.h.

**4.4.1.23 #define ngz\_MAX 1024**

Definition at line 29 of file const.h.

**4.4.1.24 #define NOF 1 /\*no of forces E=1, E+B=2\*/**

Definition at line 34 of file const.h.

#### 4.4.1.25 `#define NORMAL 0`

Definition at line 49 of file const.h.

#### 4.4.1.26 `#define NPART_MAX 5000000 /*Max no. of particles,each species per process*/`

Definition at line 31 of file const.h.

#### 4.4.1.27 `#define NPOST 3`

Definition at line 324 of file const.h.

#### 4.4.1.28 `#define NPRE 2`

Definition at line 323 of file const.h.

#### 4.4.1.29 `#define POTPOTS 101`

Definition at line 428 of file const.h.

#### 4.4.1.30 `#define PROBE 2`

Definition at line 51 of file const.h.

#### 4.4.1.31 `#define PRSEG 4`

Definition at line 57 of file const.h.

#### 4.4.1.32 `#define Q 1.602189E-19 /*elementary charge value, C*/`

Definition at line 21 of file const.h.

#### 4.4.1.33 `#define S 2 /*number of species*/`

Definition at line 39 of file const.h.

### 4.4.2 Typedef Documentation

#### 4.4.2.1 `typedef struct condsq condsq`

Definition at line 338 of file const.h.

#### 4.4.2.2 `typedef struct d_particle d_particle`

Definition at line 120 of file const.h.

#### 4.4.2.3 `typedef struct d_rho d_rho`

Definition at line 360 of file const.h.

#### 4.4.2.4 `typedef struct dtriangle dtriangle`

Definition at line 215 of file const.h.

#### 4.4.2.5 `typedef struct particle particle`

Definition at line 107 of file const.h.

#### 4.4.2.6 `typedef struct species species`

Definition at line 126 of file const.h.

#### 4.4.2.7 `typedef struct vectorst vectorst`

Definition at line 348 of file const.h.

### 4.4.3 Variable Documentation

#### 4.4.3.1 `long int alllost`

Definition at line 130 of file const.h.

#### 4.4.3.2 `long int allpart`

Definition at line 92 of file const.h.

#### 4.4.3.3 `double* ap`

Definition at line 201 of file const.h.

#### 4.4.3.4 `int average`

Definition at line 276 of file const.h.

#### 4.4.3.5 `FILE * bdens`

Definition at line 266 of file const.h.

#### 4.4.3.6 `double* Bf`

Definition at line 154 of file const.h.

#### 4.4.3.7 `int BfMAX`

Definition at line 164 of file const.h.

#### 4.4.3.8 `double * bp`

Definition at line 201 of file const.h.

**4.4.3.9 long int c0[S]**

Definition at line 382 of file const.h.

**4.4.3.10 long int c1[S]**

Definition at line 382 of file const.h.

**4.4.3.11 long int c2[S]**

Definition at line 382 of file const.h.

**4.4.3.12 long int c3[S]**

Definition at line 382 of file const.h.

**4.4.3.13 long int c4[S]**

Definition at line 382 of file const.h.

**4.4.3.14 long int c5[S]**

Definition at line 382 of file const.h.

**4.4.3.15 int\*\* ccorner**

Definition at line 366 of file const.h.

**4.4.3.16 double cellvolume**

Definition at line 191 of file const.h.

**4.4.3.17 double charge[S]**

Definition at line 71 of file const.h.

**4.4.3.18 double chargeandnorm[S]**

Definition at line 84 of file const.h.

**4.4.3.19 clock\_t clockend**

Definition at line 311 of file const.h.

**4.4.3.20 clock\_t clockstart**

Definition at line 311 of file const.h.

#### 4.4.3.21 int colltypes[S]

Definition at line 415 of file const.h.

#### 4.4.3.22 int cond\_present

Definition at line 351 of file const.h.

#### 4.4.3.23 FILE \* convergence

Definition at line 268 of file const.h.

#### 4.4.3.24 condsq\*\* csq

Definition at line 340 of file const.h.

#### 4.4.3.25 FILE\* curr

Definition at line 265 of file const.h.

#### 4.4.3.26 long int\*\* curr\_av

Definition at line 89 of file const.h.

#### 4.4.3.27 long int\*\* current

Definition at line 88 of file const.h.

#### 4.4.3.28 int\* d\_globallist

Definition at line 394 of file const.h.

#### 4.4.3.29 int\*\* d\_locallist

Definition at line 396 of file const.h.

#### 4.4.3.30 int\* d\_localmax

Definition at line 395 of file const.h.

#### 4.4.3.31 double\*\* daa

Definition at line 247 of file const.h.

#### 4.4.3.32 double \*\* daa1x

Definition at line 247 of file const.h.

**4.4.3.33 double \*\* daa1y**

Definition at line 247 of file const.h.

**4.4.3.34 double \*\* dbb**

Definition at line 247 of file const.h.

**4.4.3.35 double \*\* dbb1x**

Definition at line 247 of file const.h.

**4.4.3.36 double \*\* dbb1y**

Definition at line 247 of file const.h.

**4.4.3.37 double \*\* dcc**

Definition at line 247 of file const.h.

**4.4.3.38 double \*\* dcc1x**

Definition at line 247 of file const.h.

**4.4.3.39 double \*\* dcc1y**

Definition at line 247 of file const.h.

**4.4.3.40 double ddelta**

Definition at line 365 of file const.h.

**4.4.3.41 double ddelta2**

Definition at line 365 of file const.h.

**4.4.3.42 double debye[S]**

Definition at line 67 of file const.h.

**4.4.3.43 double debyetotal**

Definition at line 68 of file const.h.

**4.4.3.44 double dens[S]**

Definition at line 66 of file const.h.



**4.4.3.45 FILE\* dens\_err**

Definition at line 291 of file const.h.

**4.4.3.46 FILE\* dhist**

Definition at line 269 of file const.h.

**4.4.3.47 int diagint**

Definition at line 329 of file const.h.

**4.4.3.48 int \* diagint\_av**

Definition at line 329 of file const.h.

**4.4.3.49 int \* diagint\_st**

Definition at line 329 of file const.h.

**4.4.3.50 double\* dmass**

Definition at line 236 of file const.h.

**4.4.3.51 double \* dmass\_centr\_x**

Definition at line 236 of file const.h.

**4.4.3.52 double \* dmass\_centr\_y**

Definition at line 236 of file const.h.

**4.4.3.53 double \* dmass\_centr\_z**

Definition at line 236 of file const.h.

**4.4.3.54 double \* dmoml**

Definition at line 236 of file const.h.

**4.4.3.55 int\* dmove**

Definition at line 228 of file const.h.

**4.4.3.56 int\* dnumber**

Definition at line 232 of file const.h.

**4.4.3.57 d\_particle\*\* dpart**

Definition at line 133 of file const.h.

**4.4.3.58 long int\* dpartlast**

Definition at line 240 of file const.h.

**4.4.3.59 long int\* dpartmax**

Definition at line 241 of file const.h.

**4.4.3.60 double\*\* dpartq**

Definition at line 134 of file const.h.

**4.4.3.61 double\* dphifl**

Definition at line 237 of file const.h.

**4.4.3.62 double \*\* dr2v2**

Definition at line 236 of file const.h.

**4.4.3.63 double\* dradius**

Definition at line 230 of file const.h.

**4.4.3.64 double\* dradiusdx**

Definition at line 231 of file const.h.

**4.4.3.65 double\* drag\_direct\_x**

Definition at line 402 of file const.h.

**4.4.3.66 double \* drag\_direct\_y**

Definition at line 402 of file const.h.

**4.4.3.67 double \* drag\_direct\_z**

Definition at line 402 of file const.h.

**4.4.3.68 double \* drag\_elect\_x**

Definition at line 402 of file const.h.

**4.4.3.69 double \* drag\_elect\_y**

Definition at line 402 of file const.h.

**4.4.3.70 double \* drag\_elect\_z**

Definition at line 402 of file const.h.

**4.4.3.71 d\_rho\*\* drho**

Definition at line 361 of file const.h.

**4.4.3.72 int\* drholast**

Definition at line 363 of file const.h.

**4.4.3.73 double \* drot\_x\_y1**

Definition at line 403 of file const.h.

**4.4.3.74 double \* drot\_x\_y2**

Definition at line 403 of file const.h.

**4.4.3.75 double \* drot\_x\_z1**

Definition at line 403 of file const.h.

**4.4.3.76 double \* drot\_x\_z2**

Definition at line 403 of file const.h.

**4.4.3.77 double \* drot\_y\_x1**

Definition at line 403 of file const.h.

**4.4.3.78 double \* drot\_y\_x2**

Definition at line 403 of file const.h.

**4.4.3.79 double \* drot\_y\_z1**

Definition at line 403 of file const.h.

**4.4.3.80 double \* drot\_y\_z2**

Definition at line 403 of file const.h.

**4.4.3.81 double\* drot\_z\_x1**

Definition at line 403 of file const.h.

**4.4.3.82 double \* drot\_z\_x2**

Definition at line 403 of file const.h.

**4.4.3.83 double \* drot\_z\_y1**

Definition at line 403 of file const.h.

**4.4.3.84 double \* drot\_z\_y2**

Definition at line 403 of file const.h.

**4.4.3.85 int\* dshape**

Definition at line 229 of file const.h.

**4.4.3.86 double dt**

Definition at line 171 of file const.h.

**4.4.3.87 double dtdx**

Definition at line 175 of file const.h.

**4.4.3.88 double dtdy**

Definition at line 175 of file const.h.

**4.4.3.89 double dtdz**

Definition at line 175 of file const.h.

**4.4.3.90 dtriangle\*\* dtrian**

Definition at line 238 of file const.h.

**4.4.3.91 int\* dtype**

Definition at line 227 of file const.h.

**4.4.3.92 FILE \* dust\_time**

Definition at line 268 of file const.h.

**4.4.3.93 double \*\* dusta**

Definition at line 218 of file const.h.

**4.4.3.94 double \* dustaccx**

Definition at line 243 of file const.h.

**4.4.3.95 double \* dustaccy**

Definition at line 243 of file const.h.

**4.4.3.96 double \* dustaccz**

Definition at line 243 of file const.h.

**4.4.3.97 double \*\* dustb**

Definition at line 218 of file const.h.

**4.4.3.98 double \*\* dustbdy**

Definition at line 218 of file const.h.

**4.4.3.99 FILE\* dustcharge**

Definition at line 268 of file const.h.

**4.4.3.100 double\* dustcx**

Definition at line 224 of file const.h.

**4.4.3.101 double \* dustcxdx**

Definition at line 224 of file const.h.

**4.4.3.102 double \* dustcy**

Definition at line 224 of file const.h.

**4.4.3.103 double \* dustcydx**

Definition at line 224 of file const.h.

**4.4.3.104 double \* dustcz**

Definition at line 224 of file const.h.

**4.4.3.105 double \* dustczdx**

Definition at line 224 of file const.h.

**4.4.3.106 double \* duste**

Definition at line 243 of file const.h.

**4.4.3.107 int dustmove**

Definition at line 351 of file const.h.

**4.4.3.108 double \* dustomega**

Definition at line 243 of file const.h.

**4.4.3.109 double \* dustpcx**

Definition at line 224 of file const.h.

**4.4.3.110 double \* dustpcy**

Definition at line 224 of file const.h.

**4.4.3.111 double \* dustpcz**

Definition at line 224 of file const.h.

**4.4.3.112 double\*\* dustq**

Definition at line 219 of file const.h.

**4.4.3.113 double \* dustrho**

Definition at line 236 of file const.h.

**4.4.3.114 FILE\* dustshape**

Definition at line 270 of file const.h.

**4.4.3.115 FILE \* dustshapet**

Definition at line 316 of file const.h.

**4.4.3.116 int\*\* dustv**

Definition at line 223 of file const.h.

**4.4.3.117 double\*\* dustvx**

Definition at line 244 of file const.h.

**4.4.3.118 double\* dustvxc**

Definition at line 243 of file const.h.

**4.4.3.119 double \*\* dustvy**

Definition at line 244 of file const.h.

**4.4.3.120 double \* dustvyc**

Definition at line 243 of file const.h.

**4.4.3.121 double \*\* dustvz**

Definition at line 244 of file const.h.

**4.4.3.122 double \* dustvzc**

Definition at line 243 of file const.h.

**4.4.3.123 double\* dustworkfunct**

Definition at line 250 of file const.h.

**4.4.3.124 double\*\* dustx**

Definition at line 218 of file const.h.

**4.4.3.125 double \*\* dustxdx**

Definition at line 218 of file const.h.

**4.4.3.126 double\*\* dustdxold**

Definition at line 222 of file const.h.

**4.4.3.127 double\*\* dustxnormv**

Definition at line 376 of file const.h.

**4.4.3.128 double \*\* dusty**

Definition at line 218 of file const.h.

**4.4.3.129 double \*\* dustydy**

Definition at line 218 of file const.h.

**4.4.3.130 double \*\* dustydyold**

Definition at line 222 of file const.h.

**4.4.3.131 double \*\* dustynormv**

Definition at line 376 of file const.h.

**4.4.3.132 double \*\* dustz**

Definition at line 218 of file const.h.

**4.4.3.133 double \*\* dustzdz**

Definition at line 218 of file const.h.

**4.4.3.134 double \*\* dustzdzold**

Definition at line 222 of file const.h.

**4.4.3.135 double dV**

Definition at line 176 of file const.h.

**4.4.3.136 double dVdt**

Definition at line 178 of file const.h.

**4.4.3.137 double dx**

Definition at line 172 of file const.h.

**4.4.3.138 double dxdt**

Definition at line 174 of file const.h.

**4.4.3.139 double dxdy**

Definition at line 176 of file const.h.

**4.4.3.140 double dxdydt**

Definition at line 178 of file const.h.



**4.4.3.141 double dxdz**

Definition at line 177 of file const.h.

**4.4.3.142 double dy**

Definition at line 172 of file const.h.

**4.4.3.143 double dydt**

Definition at line 174 of file const.h.

**4.4.3.144 double dz**

Definition at line 172 of file const.h.

**4.4.3.145 double dzdt**

Definition at line 174 of file const.h.

**4.4.3.146 FILE\* eavvel**

Definition at line 271 of file const.h.

**4.4.3.147 FILE \* edens**

Definition at line 266 of file const.h.

**4.4.3.148 FILE \* efx**

Definition at line 266 of file const.h.

**4.4.3.149 FILE \* efy**

Definition at line 266 of file const.h.

**4.4.3.150 FILE \* efz**

Definition at line 266 of file const.h.

**4.4.3.151 FILE \* eke**

Definition at line 267 of file const.h.

**4.4.3.152 FILE \* eke\_time**

Definition at line 267 of file const.h.

4.4.3.153 `double * elrot_x_y1`

Definition at line 404 of file const.h.

4.4.3.154 `double * elrot_x_y2`

Definition at line 404 of file const.h.

4.4.3.155 `double * elrot_x_z1`

Definition at line 404 of file const.h.

4.4.3.156 `double * elrot_x_z2`

Definition at line 404 of file const.h.

4.4.3.157 `double * elrot_y_x1`

Definition at line 404 of file const.h.

4.4.3.158 `double * elrot_y_x2`

Definition at line 404 of file const.h.

4.4.3.159 `double * elrot_y_z1`

Definition at line 404 of file const.h.

4.4.3.160 `double * elrot_y_z2`

Definition at line 404 of file const.h.

4.4.3.161 `double* elrot_z_x1`

Definition at line 404 of file const.h.

4.4.3.162 `double * elrot_z_x2`

Definition at line 404 of file const.h.

4.4.3.163 `double * elrot_z_y1`

Definition at line 404 of file const.h.

4.4.3.164 `double * elrot_z_y2`

Definition at line 404 of file const.h.

**4.4.3.165 FILE\* epe**

Definition at line 267 of file const.h.

**4.4.3.166 FILE \* epe\_time**

Definition at line 267 of file const.h.

**4.4.3.167 FILE\* evxphs**

Definition at line 272 of file const.h.

**4.4.3.168 double extrapart[S][6]**

Definition at line 255 of file const.h.

**4.4.3.169 double flux[S][6]**

Definition at line 253 of file const.h.

**4.4.3.170 double fluxrest[S][6]**

Definition at line 254 of file const.h.

**4.4.3.171 int fmg\_mingridx**

Definition at line 326 of file const.h.

**4.4.3.172 int fmg\_mingridy**

Definition at line 326 of file const.h.

**4.4.3.173 int fmg\_mingridz**

Definition at line 326 of file const.h.

**4.4.3.174 int fmg\_ng**

Definition at line 326 of file const.h.

**4.4.3.175 int fmg\_nnx**

Definition at line 326 of file const.h.

**4.4.3.176 int fmg\_nny**

Definition at line 326 of file const.h.

4.4.3.177 int fmg\_nnz

Definition at line 326 of file const.h.

4.4.3.178 FILE\* force\_chk

Definition at line 379 of file const.h.

4.4.3.179 FILE\* fp

Definition at line 264 of file const.h.

4.4.3.180 FILE \* fp2

Definition at line 264 of file const.h.

4.4.3.181 FILE \* frho

Definition at line 266 of file const.h.

4.4.3.182 double\* Fs

Definition at line 153 of file const.h.

4.4.3.183 double\* Fs\_nodust

Definition at line 387 of file const.h.

4.4.3.184 int FsBy

Definition at line 164 of file const.h.

4.4.3.185 int FsBz

Definition at line 164 of file const.h.

4.4.3.186 int FsEy

Definition at line 163 of file const.h.

4.4.3.187 int FsEz

Definition at line 163 of file const.h.

4.4.3.188 int FsMAX

Definition at line 162 of file const.h.

**4.4.3.189 double Gx**

Definition at line 168 of file const.h.

**4.4.3.190 double Gy**

Definition at line 168 of file const.h.

**4.4.3.191 double Gz**

Definition at line 168 of file const.h.

**4.4.3.192 FILE\* history**

Definition at line 310 of file const.h.

**4.4.3.193 FILE \* iavvel**

Definition at line 271 of file const.h.

**4.4.3.194 FILE \* idens**

Definition at line 266 of file const.h.

**4.4.3.195 FILE \* ike**

Definition at line 267 of file const.h.

**4.4.3.196 FILE \* ike\_time**

Definition at line 267 of file const.h.

**4.4.3.197 FILE \* ipe**

Definition at line 267 of file const.h.

**4.4.3.198 FILE \* ipe\_time**

Definition at line 267 of file const.h.

**4.4.3.199 double\*\*\* ires[NGMAX+1]**

Definition at line 327 of file const.h.

**4.4.3.200 double \*\*\* irho[NGMAX+1]**

Definition at line 327 of file const.h.

**4.4.3.201**   `double *** irhs[NGMAX+1]`

Definition at line 327 of file const.h.

**4.4.3.202**   `double *** iu[NGMAX+1]`

Definition at line 327 of file const.h.

**4.4.3.203**   `FILE * ivxphs`

Definition at line 272 of file const.h.

**4.4.3.204**   `double* KE`

Definition at line 157 of file const.h.

**4.4.3.205**   `int KE_off`

Definition at line 163 of file const.h.

**4.4.3.206**   `int KEMAX`

Definition at line 162 of file const.h.

**4.4.3.207**   `double llb[S]`

Definition at line 260 of file const.h.

**4.4.3.208**   `double lldx`

Definition at line 389 of file const.h.

**4.4.3.209**   `double lldy`

Definition at line 389 of file const.h.

**4.4.3.210**   `double lldz`

Definition at line 389 of file const.h.

**4.4.3.211**   `int* llmesh`

Definition at line 385 of file const.h.

**4.4.3.212**   `int llngx`

Definition at line 388 of file const.h.

**4.4.3.213 int llngy**

Definition at line 388 of file const.h.

**4.4.3.214 int llngz**

Definition at line 388 of file const.h.

**4.4.3.215 long int llsiz**

Definition at line 390 of file const.h.

**4.4.3.216 long int lostlist[S][NPART\_MAX]**

Definition at line 129 of file const.h.

**4.4.3.217 long int lostpart[S]**

Definition at line 86 of file const.h.

**4.4.3.218 int\*\* lut**

Definition at line 226 of file const.h.

**4.4.3.219 double lv0[S]**

Definition at line 260 of file const.h.

**4.4.3.220 double Lx**

Definition at line 167 of file const.h.

**4.4.3.221 double Ly**

Definition at line 167 of file const.h.

**4.4.3.222 double Lz**

Definition at line 167 of file const.h.

**4.4.3.223 double lzet[S]**

Definition at line 260 of file const.h.

**4.4.3.224 double mass[S]**

Definition at line 70 of file const.h.

**4.4.3.225 double massneutrals**

Definition at line 411 of file const.h.

**4.4.3.226 double \* maxx**

Definition at line 201 of file const.h.

**4.4.3.227 double \* maxy**

Definition at line 201 of file const.h.

**4.4.3.228 double \* minx**

Definition at line 201 of file const.h.

**4.4.3.229 double \* miny**

Definition at line 201 of file const.h.

**4.4.3.230 int mpicheck**

Definition at line 296 of file const.h.

**4.4.3.231 int\* ncorners**

Definition at line 225 of file const.h.

**4.4.3.232 double ndensity**

Definition at line 413 of file const.h.

**4.4.3.233 FILE\* newprobe**

Definition at line 273 of file const.h.

**4.4.3.234 int ngx**

Definition at line 173 of file const.h.

**4.4.3.235 int ngy**

Definition at line 173 of file const.h.

**4.4.3.236 int ngz**

Definition at line 173 of file const.h.



**4.4.3.237 int noofdusts**

Definition at line 233 of file const.h.

**4.4.3.238 int\* noofftriangles**

Definition at line 239 of file const.h.

**4.4.3.239 double normalcharge[S]**

Definition at line 72 of file const.h.

**4.4.3.240 double normcharge**

Definition at line 184 of file const.h.

**4.4.3.241 double normdens**

Definition at line 188 of file const.h.

**4.4.3.242 double normEfield**

Definition at line 187 of file const.h.

**4.4.3.243 double normmass**

Definition at line 185 of file const.h.

**4.4.3.244 double normPE**

Definition at line 190 of file const.h.

**4.4.3.245 double normpot**

Definition at line 183 of file const.h.

**4.4.3.246 double normPP**

Definition at line 192 of file const.h.

**4.4.3.247 double normqdens**

Definition at line 189 of file const.h.

**4.4.3.248 double normqm**

Definition at line 186 of file const.h.

**4.4.3.249 double normtime**

Definition at line 180 of file const.h.

**4.4.3.250 double normvel**

Definition at line 181 of file const.h.

**4.4.3.251 double normx**

Definition at line 182 of file const.h.

**4.4.3.252 long int npart[S]**

Definition at line 80 of file const.h.

**4.4.3.253 long int npartinit[S]**

Definition at line 81 of file const.h.

**4.4.3.254 double nullcoll[S]**

Definition at line 408 of file const.h.

**4.4.3.255 double nullcollfreq[S]**

Definition at line 410 of file const.h.

**4.4.3.256 double nullcollrest[S]**

Definition at line 409 of file const.h.

**4.4.3.257 int numberofprints**

Definition at line 274 of file const.h.

**4.4.3.258 int numtasks**

Definition at line 296 of file const.h.

**4.4.3.259 double omegap[S]**

Definition at line 69 of file const.h.

**4.4.3.260 vectorst \*\* orthvec**

Definition at line 350 of file const.h.

**4.4.3.261 vectorst \*\* orthvecseg**

Definition at line 350 of file const.h.

**4.4.3.262 int particlesno**

Definition at line 288 of file const.h.

**4.4.3.263 double\* pdens**

Definition at line 156 of file const.h.

**4.4.3.264 int pdens\_off**

Definition at line 163 of file const.h.

**4.4.3.265 int pdensMAX**

Definition at line 162 of file const.h.

**4.4.3.266 double\* PE**

Definition at line 148 of file const.h.

**4.4.3.267 FILE \* pe**

Definition at line 267 of file const.h.

**4.4.3.268 FILE \* pe\_time**

Definition at line 267 of file const.h.

**4.4.3.269 int PEMAX**

Definition at line 162 of file const.h.

**4.4.3.270 int PEMAXhalf**

Definition at line 163 of file const.h.

**4.4.3.271 double\* PEttotal**

Definition at line 149 of file const.h.

**4.4.3.272 int PEttotalMAX**

Definition at line 162 of file const.h.

**4.4.3.273 double ph\_a**

Definition at line 373 of file const.h.

**4.4.3.274 double ph\_angle**

Definition at line 375 of file const.h.

**4.4.3.275 double ph\_angle\_rad**

Definition at line 375 of file const.h.

**4.4.3.276 double ph\_bmax**

Definition at line 373 of file const.h.

**4.4.3.277 double ph\_bmin**

Definition at line 373 of file const.h.

**4.4.3.278 double ph\_cosangle**

Definition at line 375 of file const.h.

**4.4.3.279 double ph\_energy**

Definition at line 375 of file const.h.

**4.4.3.280 double ph\_flux**

Definition at line 375 of file const.h.

**4.4.3.281 long int ph\_fluxprdt**

Definition at line 372 of file const.h.

**4.4.3.282 double ph\_length**

Definition at line 373 of file const.h.

**4.4.3.283 double ph\_sinangle**

Definition at line 375 of file const.h.

**4.4.3.284 int ph\_vert**

Definition at line 374 of file const.h.

**4.4.3.285 double ph\_xmax**

Definition at line 373 of file const.h.

**4.4.3.286 double ph\_xmin**

Definition at line 373 of file const.h.

**4.4.3.287 double\* phi**

Definition at line 146 of file const.h.

**4.4.3.288 double\* phi\_nodust**

Definition at line 386 of file const.h.

**4.4.3.289 double\* phiav**

Definition at line 147 of file const.h.

**4.4.3.290 int phiavMAX**

Definition at line 162 of file const.h.

**4.4.3.291 int phiMAX**

Definition at line 162 of file const.h.

**4.4.3.292 int photons**

Definition at line 371 of file const.h.

**4.4.3.293 double pi**

Definition at line 286 of file const.h.

**4.4.3.294 FILE \* pot2D**

Definition at line 266 of file const.h.

**4.4.3.295 FILE \* pot2Dav**

Definition at line 265 of file const.h.

**4.4.3.296 FILE\* pot2Dclr**

Definition at line 266 of file const.h.

**4.4.3.297 FILE \* potclr**

Definition at line 265 of file const.h.

**4.4.3.298 double\* potconv[CONVTEST]**

Definition at line 151 of file const.h.

**4.4.3.299 int potconvMAX**

Definition at line 162 of file const.h.

**4.4.3.300 FILE\* potdistr**

Definition at line 424 of file const.h.

**4.4.3.301 int potdistrarray[POTPOTS]**

Definition at line 429 of file const.h.

**4.4.3.302 double potdistrmax**

Definition at line 425 of file const.h.

**4.4.3.303 double potdistrmin**

Definition at line 426 of file const.h.

**4.4.3.304 FILE \* poten**

Definition at line 265 of file const.h.

**4.4.3.305 double primerootbucket[BUCKETSIZE]**

Definition at line 280 of file const.h.

**4.4.3.306 double primerootno**

Definition at line 281 of file const.h.

**4.4.3.307 int probe\_version**

Definition at line 195 of file const.h.

**4.4.3.308 FILE\* probes1**

Definition at line 316 of file const.h.

**4.4.3.309 FILE\* probes11**

Definition at line 419 of file const.h.

**4.4.3.310 FILE \* probes12**

Definition at line 419 of file const.h.

**4.4.3.311 FILE \* probes13**

Definition at line 419 of file const.h.

**4.4.3.312 FILE \* probes14**

Definition at line 419 of file const.h.

**4.4.3.313 FILE \* probes15**

Definition at line 419 of file const.h.

**4.4.3.314 FILE \* probes16**

Definition at line 419 of file const.h.

**4.4.3.315 FILE \* probes17**

Definition at line 419 of file const.h.

**4.4.3.316 FILE \* probes18**

Definition at line 419 of file const.h.

**4.4.3.317 FILE \* probes19**

Definition at line 419 of file const.h.

**4.4.3.318 FILE \* probes2**

Definition at line 316 of file const.h.

**4.4.3.319 FILE\* probes21**

Definition at line 420 of file const.h.

**4.4.3.320 FILE \* probes22**

Definition at line 420 of file const.h.

**4.4.3.321 FILE \* probes23**

Definition at line 420 of file const.h.

**4.4.3.322 FILE \* probes24**

Definition at line 420 of file const.h.

**4.4.3.323 FILE \* probes25**

Definition at line 420 of file const.h.

**4.4.3.324 FILE \* probes26**

Definition at line 420 of file const.h.

**4.4.3.325 FILE \* probes27**

Definition at line 420 of file const.h.

**4.4.3.326 FILE \* probes28**

Definition at line 420 of file const.h.

**4.4.3.327 FILE \* probes29**

Definition at line 420 of file const.h.

**4.4.3.328 FILE \* probes3**

Definition at line 316 of file const.h.

**4.4.3.329 FILE\* probes31**

Definition at line 421 of file const.h.

**4.4.3.330 FILE \* probes32**

Definition at line 421 of file const.h.

**4.4.3.331 FILE \* probes33**

Definition at line 421 of file const.h.

**4.4.3.332 FILE \* probes34**

Definition at line 421 of file const.h.



**4.4.3.333 FILE \* probes35**

Definition at line 421 of file const.h.

**4.4.3.334 FILE \* probes36**

Definition at line 421 of file const.h.

**4.4.3.335 FILE \* probes37**

Definition at line 421 of file const.h.

**4.4.3.336 FILE \* probes38**

Definition at line 421 of file const.h.

**4.4.3.337 FILE \* probes39**

Definition at line 421 of file const.h.

**4.4.3.338 int probesegments**

Definition at line 202 of file const.h.

**4.4.3.339 int probex**

Definition at line 196 of file const.h.

**4.4.3.340 double probemax**

Definition at line 198 of file const.h.

**4.4.3.341 double probexmin**

Definition at line 198 of file const.h.

**4.4.3.342 int probey**

Definition at line 196 of file const.h.

**4.4.3.343 double probeymax**

Definition at line 198 of file const.h.

**4.4.3.344 double probeymin**

Definition at line 198 of file const.h.

**4.4.3.345** `double* ptemp11`

Definition at line 416 of file const.h.

**4.4.3.346** `double * ptemp12`

Definition at line 416 of file const.h.

**4.4.3.347** `double * ptemp13`

Definition at line 416 of file const.h.

**4.4.3.348** `double * ptemp14`

Definition at line 416 of file const.h.

**4.4.3.349** `double * ptemp15`

Definition at line 416 of file const.h.

**4.4.3.350** `double * ptemp16`

Definition at line 416 of file const.h.

**4.4.3.351** `double * ptemp17`

Definition at line 416 of file const.h.

**4.4.3.352** `double * ptemp18`

Definition at line 416 of file const.h.

**4.4.3.353** `double * ptemp19`

Definition at line 416 of file const.h.

**4.4.3.354** `double* ptemp21`

Definition at line 417 of file const.h.

**4.4.3.355** `double * ptemp22`

Definition at line 417 of file const.h.

**4.4.3.356** `double * ptemp23`

Definition at line 417 of file const.h.

4.4.3.357 `double * ptemp24`

Definition at line 417 of file const.h.

4.4.3.358 `double * ptemp25`

Definition at line 417 of file const.h.

4.4.3.359 `double * ptemp26`

Definition at line 417 of file const.h.

4.4.3.360 `double * ptemp27`

Definition at line 417 of file const.h.

4.4.3.361 `double * ptemp28`

Definition at line 417 of file const.h.

4.4.3.362 `double * ptemp29`

Definition at line 417 of file const.h.

4.4.3.363 `double* ptemp31`

Definition at line 418 of file const.h.

4.4.3.364 `double * ptemp32`

Definition at line 418 of file const.h.

4.4.3.365 `double * ptemp33`

Definition at line 418 of file const.h.

4.4.3.366 `double * ptemp34`

Definition at line 418 of file const.h.

4.4.3.367 `double * ptemp35`

Definition at line 418 of file const.h.

4.4.3.368 `double * ptemp36`

Definition at line 418 of file const.h.

**4.4.3.369**   `double * ptemp37`

Definition at line 418 of file const.h.

**4.4.3.370**   `double * ptemp38`

Definition at line 418 of file const.h.

**4.4.3.371**   `double * ptemp39`

Definition at line 418 of file const.h.

**4.4.3.372**   `double* qdens`

Definition at line 150 of file const.h.

**4.4.3.373**   `int qdensMAX`

Definition at line 162 of file const.h.

**4.4.3.374**   `double qm[S]`

Definition at line 83 of file const.h.

**4.4.3.375**   `int rank`

Definition at line 296 of file const.h.

**4.4.3.376**   `double ratio`

Definition at line 93 of file const.h.

**4.4.3.377**   `long int** rcurr_av`

Definition at line 90 of file const.h.

**4.4.3.378**   `d_particle ** rdpart`

Definition at line 133 of file const.h.

**4.4.3.379**   `double ** rdpartq`

Definition at line 134 of file const.h.

**4.4.3.380**   `double* rdrho`

Definition at line 362 of file const.h.

**4.4.3.381 int rdrholast**

Definition at line 364 of file const.h.

**4.4.3.382 double\* rho**

Definition at line 155 of file const.h.

**4.4.3.383 int rhoMAX**

Definition at line 162 of file const.h.

**4.4.3.384 int rhoMAXhalf**

Definition at line 163 of file const.h.

**4.4.3.385 double \* rKE**

Definition at line 160 of file const.h.

**4.4.3.386 double rlb[S]**

Definition at line 261 of file const.h.

**4.4.3.387 double \* rpdens**

Definition at line 160 of file const.h.

**4.4.3.388 double\* rrho**

Definition at line 160 of file const.h.

**4.4.3.389 double rv0[S]**

Definition at line 261 of file const.h.

**4.4.3.390 double rvdrtfx[S]**

Definition at line 262 of file const.h.

**4.4.3.391 double \* rvxvec**

Definition at line 160 of file const.h.

**4.4.3.392 double \* rvyvec**

Definition at line 160 of file const.h.

**4.4.3.393**   `double * rvzvec`

Definition at line 160 of file const.h.

**4.4.3.394**   `double rzet[S]`

Definition at line 261 of file const.h.

**4.4.3.395**   `double* sigma`

Definition at line 414 of file const.h.

**4.4.3.396**   `species spec[S]`

Definition at line 128 of file const.h.

**4.4.3.397**   `double sqrt_pi`

Definition at line 284 of file const.h.

**4.4.3.398**   `double sqrt_two`

Definition at line 283 of file const.h.

**4.4.3.399**   `double sqrt_twopi`

Definition at line 285 of file const.h.

**4.4.3.400**   `long int superfast`

Definition at line 87 of file const.h.

**4.4.3.401**   `int takecut`

Definition at line 290 of file const.h.

**4.4.3.402**   `double tempx[S]`

Definition at line 73 of file const.h.

**4.4.3.403**   `double tempy[S]`

Definition at line 74 of file const.h.

**4.4.3.404**   `double tempz[S]`

Definition at line 75 of file const.h.

**4.4.3.405 FILE\* testowy**

Definition at line 399 of file const.h.

**4.4.3.406 double ti2te**

Definition at line 85 of file const.h.

**4.4.3.407 double timeelapsed**

Definition at line 313 of file const.h.

**4.4.3.408 time\_t timeending**

Definition at line 312 of file const.h.

**4.4.3.409 int timerprobes**

Definition at line 317 of file const.h.

**4.4.3.410 time\_t timestart**

Definition at line 312 of file const.h.

**4.4.3.411 double tmax**

Definition at line 171 of file const.h.

**4.4.3.412 d\_particle\* tmp\_dpart**

Definition at line 318 of file const.h.

**4.4.3.413 double TOLERANCE**

Definition at line 62 of file const.h.

**4.4.3.414 double tofloating**

Definition at line 63 of file const.h.

**4.4.3.415 double \* tordrho**

Definition at line 362 of file const.h.

**4.4.3.416 double totalflux[S]**

Definition at line 256 of file const.h.

**4.4.3.417   vectorst\*\* unitvec**

Definition at line 350 of file const.h.

**4.4.3.418   vectorst \*\* unitvecseg**

Definition at line 350 of file const.h.

**4.4.3.419   double Vbound**

Definition at line 258 of file const.h.

**4.4.3.420   double vdriftx[S]**

Definition at line 82 of file const.h.

**4.4.3.421   int\* vertp**

Definition at line 200 of file const.h.

**4.4.3.422   int\*\* vipcorner**

Definition at line 367 of file const.h.

**4.4.3.423   double vmean[S]**

Definition at line 91 of file const.h.

**4.4.3.424   double Vpr**

Definition at line 197 of file const.h.

**4.4.3.425   double Vpr\_begin**

Definition at line 197 of file const.h.

**4.4.3.426   double Vpr\_end**

Definition at line 197 of file const.h.

**4.4.3.427   double Vpr\_step**

Definition at line 197 of file const.h.

**4.4.3.428   double vthneutr**

Definition at line 412 of file const.h.



**4.4.3.429 double vthx[S]**

Definition at line 76 of file const.h.

**4.4.3.430 double vthy[S]**

Definition at line 77 of file const.h.

**4.4.3.431 double vthz[S]**

Definition at line 78 of file const.h.

**4.4.3.432 double\* vxvec**

Definition at line 158 of file const.h.

**4.4.3.433 double \* vyvec**

Definition at line 158 of file const.h.

**4.4.3.434 double \* vzvec**

Definition at line 158 of file const.h.

**4.4.3.435 double weight**

Definition at line 275 of file const.h.

**4.4.3.436 double \* x1p**

Definition at line 201 of file const.h.

## 4.5 src/diagn.c File Reference

```
#include "const.h"
```

Include dependency graph for diagn.c:

### Functions

- void [diagn\\_open](#) ()
- void [diagn\\_close](#) ()
- void [printgrid](#) (int t)
- void [printconvpot](#) (FILE \*fpointer, int t, int step)
- void [printscales](#) (FILE \*fpointer)
- void [printqdensity](#) (FILE \*fpointer, int t, double [weight](#))
- void [printdensity](#) (FILE \*fpointer, int kk, int t, double [weight](#))
- void [print\\_avpvel](#) (FILE \*fpointer, int k, int t, double [weight](#))
- void [printpotential](#) (FILE \*fpointer, int t, double [weight](#))
- void [printavpotential](#) (FILE \*fpointer, int t, double [weight](#))

- void [printfield](#) (FILE \*fpointer, int help, int t, double [weight](#))
- void [printKEall](#) (int t)
- void [printKE](#) (FILE \*fpointer, FILE \*fpointer2, int specie, int t, double [weight](#))
- void [printPE](#) (FILE \*fpointer, FILE \*fpointer2, int specie, int t, double [weight](#))
- void [printPEtotal](#) (FILE \*fpointer, FILE \*fpointer2, int t, double [weight](#))
- void [printnewprobe](#) (FILE \*fpointer, int t, double [weight](#))
- void [printdustcharge](#) (FILE \*fpointer, int t, double [weight](#))
- void [printdustargetime](#) (FILE \*fpointer, int t, double [weight](#))
- void [printdth](#) (FILE \*fpointer, int t)
- void [printdustshape](#) ()
- void [printdustshapetime](#) (int t)
- void [pot\\_probes](#) (int t)
- void [pot\\_probes\\_init](#) (void)
- void [print\\_current](#) (int tid)
- void [printpotdistribution](#) (int t)

## 4.5.1 Function Documentation

### 4.5.1.1 void [diagn\\_close](#) ( void )

Definition at line 111 of file [diagn.c](#).

### 4.5.1.2 void [diagn\\_open](#) ( void )

Definition at line 24 of file [diagn.c](#).

### 4.5.1.3 void [pot\\_probes](#) ( int t )

Definition at line 1390 of file [diagn.c](#).

### 4.5.1.4 void [pot\\_probes\\_init](#) ( void )

Definition at line 1582 of file [diagn.c](#).

### 4.5.1.5 void [print\\_avpvel](#) ( FILE \* *fpointer*, int *k*, int *t*, double *weight* )

Definition at line 993 of file [diagn.c](#).

### 4.5.1.6 void [print\\_current](#) ( int *tid* )

Definition at line 1979 of file [diagn.c](#).

### 4.5.1.7 void [printavpotential](#) ( FILE \* *fpointer*, int *t*, double *weight* )

Definition at line 1055 of file [diagn.c](#).

### 4.5.1.8 void [printconvpot](#) ( FILE \* *fpointer*, int *t*, int *step* )

Definition at line 756 of file [diagn.c](#).

4.5.1.9 void printdensity ( FILE \* *fpointer*, int *kk*, int *t*, double *weight* )

Definition at line 844 of file diagn.c.

4.5.1.10 void printdth ( FILE \* *fpointer*, int *t* )

Definition at line 1305 of file diagn.c.

4.5.1.11 void printdustcharge ( FILE \* *fpointer*, int *t*, double *weight* )

Definition at line 1235 of file diagn.c.

4.5.1.12 void printdustargetime ( FILE \* *fpointer*, int *t*, double *weight* )

Definition at line 1264 of file diagn.c.

4.5.1.13 void printdustshape ( void )

Definition at line 1346 of file diagn.c.

4.5.1.14 void printdustshapetime ( int *t* )

Definition at line 1368 of file diagn.c.

4.5.1.15 void printefield ( FILE \* *fpointer*, int *help*, int *t*, double *weight* )

Definition at line 1070 of file diagn.c.

4.5.1.16 void printgrid ( int *t* )

Definition at line 177 of file diagn.c.

4.5.1.17 void printKE ( FILE \* *fpointer*, FILE \* *fpointer2*, int *specie*, int *t*, double *weight* )

Definition at line 1108 of file diagn.c.

4.5.1.18 void printKEall ( int *t* )

Definition at line 1093 of file diagn.c.

4.5.1.19 void printnewprobe ( FILE \* *fpointer*, int *t*, double *weight* )

Definition at line 1207 of file diagn.c.

4.5.1.20 void printPE ( FILE \* *fpointer*, FILE \* *fpointer2*, int *specie*, int *t*, double *weight* )

Definition at line 1154 of file diagn.c.

4.5.1.21 void printPEtotal ( FILE \* *fpointer*, FILE \* *fpointer2*, int *t*, double *weight* )

Definition at line 1183 of file diagn.c.

4.5.1.22 void printpotdistribution ( int *t* )

Definition at line 2023 of file diagn.c.

4.5.1.23 void printpotential ( FILE \* *fpointer*, int *t*, double *weight* )

Definition at line 1034 of file diagn.c.

4.5.1.24 void printqdensity ( FILE \* *fpointer*, int *t*, double *weight* )

Definition at line 803 of file diagn.c.

4.5.1.25 void printscale ( FILE \* *fpointer* )

Definition at line 777 of file diagn.c.

## 4.6 src/dustg.c File Reference

```
#include "const.h"
```

Include dependency graph for dustg.c:

### Functions

- void [d\\_move](#) (int *t*)
- void [calculate\\_staticparameters](#) (int *arc*, char \**arv*[])
- void [memorydpart](#) (int *no*, int *dmax*)
- void [memoryduststatic](#) (int *no*)
- void [d\\_centreofmass\\_and\\_moml](#) ()
- void [redistribute](#) (double *coeff*)
- void [weightingdust1](#) (int *ko*)
- void [checkcond](#) (void)
- void [chargeoncond](#) (int *i*)
- void [virtpart](#) (void)
- void [ortnormvec](#) (void)
- void [condsquares](#) (void)
- double [finddustvolume](#) (int *arc*, char \**arv*[])
- double [dustarea](#) (int *arc*, char \**arv*[])
- void [average\\_current](#) (void)
- void [drag\\_force\\_direct](#) (double *partvxnew*, double *partvynew*, double *partvznew*, int *particlespecie*, int *dno*, double *partxhit*, double *partyhit*, double *partzhit*)
- void [drag\\_force\\_electric](#) (void)
- void [printdragforce](#) (int *timestep*)
- int [signof](#) (int *a*)
- double [smaller\\_same\\_sign](#) (double *a*, double *b*)

## 4.6.1 Function Documentation

### 4.6.1.1 void average\_current ( void )

Definition at line 1276 of file dustg.c.

### 4.6.1.2 void calculate\_staticparameters ( int *arc*, char \* *arv*[] )

Definition at line 262 of file dustg.c.

### 4.6.1.3 void chargeoncond ( int *i* )

Definition at line 614 of file dustg.c.

### 4.6.1.4 void checkcond ( void )

Definition at line 539 of file dustg.c.

### 4.6.1.5 void condsquares ( void )

Definition at line 961 of file dustg.c.

### 4.6.1.6 void d\_centreofmass\_and\_moml ( void )

Definition at line 351 of file dustg.c.

### 4.6.1.7 void d\_move ( int *t* )

```
tempy=sinphi*(csq[i][j].x2-dmass_centra_x[i])+cosphi*(csq[i][j].y2-dmass_centra_y[i]);
```

Definition at line 9 of file dustg.c.

### 4.6.1.8 void drag\_force\_direct ( double *partvxnew*, double *partvynew*, double *partvznew*, int *particlespecie*, int *dno*, double *partxhit*, double *partyhit*, double *partzhit* )

Definition at line 1288 of file dustg.c.

### 4.6.1.9 void drag\_force\_electric ( void )

Definition at line 1399 of file dustg.c.

### 4.6.1.10 double dustarea ( int *arc*, char \* *arv*[] )

Definition at line 1183 of file dustg.c.

### 4.6.1.11 double finddustvolume ( int *arc*, char \* *arv*[] )

Definition at line 1078 of file dustg.c.

#### 4.6.1.12 void memorydpart ( int *no*, int *dmax* )

Definition at line 287 of file dustg.c.

#### 4.6.1.13 void memoryduststatic ( int *no* )

Definition at line 314 of file dustg.c.

#### 4.6.1.14 void ortnormvec ( void )

Definition at line 890 of file dustg.c.

#### 4.6.1.15 void printdragforce ( int *timestep* )

Definition at line 1544 of file dustg.c.

#### 4.6.1.16 void redistribute ( double *coeff* )

Definition at line 399 of file dustg.c.

#### 4.6.1.17 int signof ( int *a* ) [inline]

Definition at line 1724 of file dustg.c.

#### 4.6.1.18 double smaller\_same\_sign ( double *a*, double *b* ) [inline]

Definition at line 1730 of file dustg.c.

#### 4.6.1.19 void virtpart ( void )

Definition at line 725 of file dustg.c.

#### 4.6.1.20 void weightingdust1 ( int *ko* )

Definition at line 438 of file dustg.c.

## 4.7 src/flux.c File Reference

```
#include <math.h>
#include "const.h"
Include dependency graph for flux.c:
```

### Functions

- double [erfcc](#) (double *x*)
- double [cumfprim](#) (double *v0*, int *i*)
- double [zet1](#) (int *i*)
- double [cumf](#) (double *v0*, int *i*)
- void [init\\_newpart](#) ()
- void [calculate\\_flux](#) (void)

### 4.7.1 Function Documentation

#### 4.7.1.1 void calculate\_flux ( void )

Definition at line 69 of file flux.c.

#### 4.7.1.2 double cumf ( double v0, int i )

Definition at line 34 of file flux.c.

#### 4.7.1.3 double cumfprim ( double v0, int i )

Definition at line 23 of file flux.c.

#### 4.7.1.4 double erfcc ( double x )

Definition at line 14 of file flux.c.

#### 4.7.1.5 void init\_newpart ( void )

Definition at line 46 of file flux.c.

#### 4.7.1.6 double zet1 ( int i )

Definition at line 27 of file flux.c.

## 4.8 src/fmg/fmg.c File Reference

```
#include <stdio.h>
#include <math.h>
#include "nrutil.h"
#include "../const.h"
Include dependency graph for fmg.c:
```

### Macros

- `#define NRANSI`
- `#define NPRES 2`
- `#define NPOST 3`

### Functions

- int `ix` (int off, int i, int j, int k)
- void `mglin_init` (int nx, int ny, int nz)
- void `mglin_destroy` ()
- void `mglin` (double \*u, int ncycle)
- void `rstrct` (double \*\*\*uc, double \*\*\*uf, int ncx, int ncy, int ncx)
- void `rstrct0` (double \*\*\*uc, double \*uf, int ncx, int ncy, int ncx)
- void `interp` (double \*\*\*uf, double \*\*\*uc, int nfx, int nfy, int nfz)
- void `addint` (double \*\*\*uf, double \*\*\*uc, double \*\*\*res, int nfx, int nfy, int nfz)

- void `slvsml` (double \*\*\**u*, double \*\*\**rhs*)
- void `slvsml2` (double \*\*\**u*, double \*\*\**rhs*, int *nx*, int *ny*, int *nz*)
- void `relax` (double \*\*\**u*, double \*\*\**rhs*, int *nx*, int *ny*, int *nz*)
- void `resid` (double \*\*\**res*, double \*\*\**u*, double \*\*\**rhs*, int *nx*, int *ny*, int *nz*)
- void `copy` (double \*\*\**aout*, double \*\*\**ain*, int *nx*, int *ny*, int *nz*)
- void `copy0` (double \*\*\**aout*, double \**ain*, int *nx*, int *ny*, int *nz*)
- void `copyfinal` (double \**aout*, double \*\*\**ain*, int *nx*, int *ny*, int *nz*)
- void `fill0` (double \*\*\**u*, int *nx*, int *ny*, int *nz*)

## 4.8.1 Macro Definition Documentation

### 4.8.1.1 `#define NPOST 3`

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

### 4.8.1.2 `#define NPRE 2`

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

### 4.8.1.3 `#define NRANSI`

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

## 4.8.2 Function Documentation

### 4.8.2.1 void `addint` ( double \*\*\* *uf*, double \*\*\* *uc*, double \*\*\* *res*, int *nfx*, int *nfy*, int *nfz* )

Definition at line 527 of file `fmg.c`.

### 4.8.2.2 void `copy` ( double \*\*\* *aout*, double \*\*\* *ain*, int *nx*, int *ny*, int *nz* )

Definition at line 680 of file `fmg.c`.

### 4.8.2.3 void `copy0` ( double \*\*\* *aout*, double \* *ain*, int *nx*, int *ny*, int *nz* )

Definition at line 700 of file `fmg.c`.

### 4.8.2.4 void `copyfinal` ( double \* *aout*, double \*\*\* *ain*, int *nx*, int *ny*, int *nz* )

Definition at line 713 of file `fmg.c`.

### 4.8.2.5 void `fill0` ( double \*\*\* *u*, int *nx*, int *ny*, int *nz* )

Definition at line 723 of file `fmg.c`.

### 4.8.2.6 void `interp` ( double \*\*\* *uf*, double \*\*\* *uc*, int *nfx*, int *nfy*, int *nfz* )

Definition at line 479 of file `fmg.c`.



4.8.2.7 `int ix ( int off, int i, int j, int k ) [inline]`

Definition at line 62 of file shortcuts.c.

4.8.2.8 `void mglin ( double * u, int ncycle )`

Definition at line 170 of file fmg.c.

4.8.2.9 `void mglin_destroy ( void )`

Definition at line 151 of file fmg.c.

4.8.2.10 `void mglin_init ( int nx, int ny, int nz )`

Definition at line 21 of file fmg.c.

4.8.2.11 `void relax ( double *** u, double *** rhs, int nx, int ny, int nz )`

Definition at line 585 of file fmg.c.

4.8.2.12 `void resid ( double *** res, double *** u, double *** rhs, int nx, int ny, int nz )`

Definition at line 606 of file fmg.c.

4.8.2.13 `void rstrct ( double *** uc, double *** uf, int ncx, int ncy, int ncz )`

Definition at line 329 of file fmg.c.

4.8.2.14 `void rstrct0 ( double *** uc, double * uf, int ncx, int ncy, int ncz )`

Definition at line 396 of file fmg.c.

4.8.2.15 `void slvsm1 ( double *** u, double *** rhs )`

Definition at line 540 of file fmg.c.

4.8.2.16 `void slvsm12 ( double *** u, double *** rhs, int nx, int ny, int nz )`

Definition at line 550 of file fmg.c.

## 4.9 src/fmg/fmg\_P.c File Reference

```
#include <stdio.h>
#include <math.h>
#include "nrutil.h"
#include "../const.h"
Include dependency graph for fmg_P.c:
```

## Macros

- `#define NRANSI`
- `#define NPRE 4`
- `#define NPOST 4`

## Functions

- `int ix (int off, int i, int j, int k)`
- `void mglin_init (int nx, int ny, int nz)`
- `void mglin_destroy ()`
- `void mglin (double *u, int ncycle)`
- `void rstrct (double ***uc, double ***uf, int ncx, int ncy, int ncx)`
- `void rstrct0 (double ***uc, double *uf, int ncx, int ncy, int ncx)`
- `void interp (double ***uf, double ***uc, int nfx, int nfy, int nfz)`
- `void addint (double ***uf, double ***uc, double ***res, int nfx, int nfy, int nfz)`
- `void slvsml (double ***u, double ***rhs)`
- `void slvsml2 (double ***u, double ***rhs, int nx, int ny, int nz)`
- `void relax (double ***u, double ***rhs, int nx, int ny, int nz)`
- `void resid (double ***res, double ***u, double ***rhs, int nx, int ny, int nz)`
- `void copy (double ***aout, double ***ain, int nx, int ny, int nz)`
- `void copy0 (double ***aout, double *ain, int nx, int ny, int nz)`
- `void copyfinal (double *aout, double ***ain, int nx, int ny, int nz)`
- `void fill0 (double ***u, int nx, int ny, int nz)`

### 4.9.1 Macro Definition Documentation

#### 4.9.1.1 `#define NPOST 4`

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

#### 4.9.1.2 `#define NPRE 4`

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

#### 4.9.1.3 `#define NRANSI`

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

### 4.9.2 Function Documentation

#### 4.9.2.1 `void addint ( double *** uf, double *** uc, double *** res, int nfx, int nfy, int nfz )`

Definition at line 890 of file `fmg_P.c`.

#### 4.9.2.2 `void copy ( double *** aout, double *** ain, int nx, int ny, int nz )`

Definition at line 1210 of file `fmg_P.c`.

#### 4.9.2.3 `void copy0 ( double *** aout, double * ain, int nx, int ny, int nz )`

Definition at line 1232 of file `fmg_P.c`.

4.9.2.4 void copyfinal ( double \* *aout*, double \*\*\* *ain*, int *nx*, int *ny*, int *nz* )

Definition at line 1264 of file fmg\_P.c.

4.9.2.5 void fill0 ( double \*\*\* *u*, int *nx*, int *ny*, int *nz* )

Definition at line 1339 of file fmg\_P.c.

4.9.2.6 void interp ( double \*\*\* *uf*, double \*\*\* *uc*, int *nfx*, int *nfy*, int *nfz* )

Definition at line 823 of file fmg\_P.c.

4.9.2.7 int ix ( int *off*, int *i*, int *j*, int *k* ) [inline]

Definition at line 62 of file shortcuts.c.

4.9.2.8 void mglin ( double \* *u*, int *ncycle* )

Definition at line 184 of file fmg\_P.c.

4.9.2.9 void mglin\_destroy ( void )

Definition at line 165 of file fmg\_P.c.

4.9.2.10 void mglin\_init ( int *nx*, int *ny*, int *nz* )

Definition at line 21 of file fmg\_P.c.

4.9.2.11 void relax ( double \*\*\* *u*, double \*\*\* *rhs*, int *nx*, int *ny*, int *nz* )

Definition at line 1076 of file fmg\_P.c.

4.9.2.12 void resid ( double \*\*\* *res*, double \*\*\* *u*, double \*\*\* *rhs*, int *nx*, int *ny*, int *nz* )

Definition at line 1124 of file fmg\_P.c.

4.9.2.13 void rstrct ( double \*\*\* *uc*, double \*\*\* *uf*, int *ncx*, int *ncy*, int *ncz* )

Definition at line 521 of file fmg\_P.c.

4.9.2.14 void rstrct0 ( double \*\*\* *uc*, double \* *uf*, int *ncx*, int *ncy*, int *ncz* )

Definition at line 653 of file fmg\_P.c.

4.9.2.15 void slvsml ( double \*\*\* *u*, double \*\*\* *rhs* )

Definition at line 921 of file fmg\_P.c.

4.9.2.16 void slvsml2 ( double \*\*\* *u*, double \*\*\* *rhs*, int *nx*, int *ny*, int *nz* )

Definition at line 1006 of file fmg\_P.c.

## 4.10 src/fmg/nrutil.c File Reference

#include <stdio.h>

Include dependency graph for nrutil.c:

### Macros

- #define `NR_END` 1
- #define `FREE_ARG` char\*

### Functions

- void `nrerror` (error\_text)
- float \* `vector` (long nl, long nh)
- int \* `ivector` (long nl, long nh)
- unsigned char \* `cvector` (long nl, long nh)
- unsigned long \* `lvector` (long nl, long nh)
- double \* `dvector` (long nl, long nh)
- float \*\* `matrix` (long nrl, long nrh, long ncl, long nch)
- double \*\* `dmatrix` (long nrl, long nrh, long ncl, long nch)
- int \*\* `imatrix` (long nrl, long nrh, long ncl, long nch)
- float \*\* `submatrix` (float \*\*a, long oldrl, long oldrh, long oldcl, long oldch, long newrl, long newcl)
- float \*\* `convert_matrix` (float \*a, long nrl, long nrh, long ncl, long nch)
- float \*\*\* `f3tensor` (long nrl, long nrh, long ncl, long nch, long ndl, long ndh)
- double \*\*\* `d3tensor` (long nrl, long nrh, long ncl, long nch, long ndl, long ndh)
- void `free_vector` (float \*v, long nl, long nh)
- void `free_ivector` (int \*v, long nl, long nh)
- void `free_cvector` (unsigned char \*v, long nl, long nh)
- void `free_lvector` (unsigned long \*v, long nl, long nh)
- void `free_dvector` (double \*v, long nl, long nh)
- void `free_matrix` (float \*\*m, long nrl, long nrh, long ncl, long nch)
- void `free_dmatrix` (double \*\*m, long nrl, long nrh, long ncl, long nch)
- void `free_imatrix` (int \*\*m, long nrl, long nrh, long ncl, long nch)
- void `free_submatrix` (float \*\*b, long nrl, long nrh, long ncl, long nch)
- void `free_convert_matrix` (float \*\*b, long nrl, long nrh, long ncl, long nch)
- void `free_f3tensor` (float \*\*\*t, long nrl, long nrh, long ncl, long nch, long ndl, long ndh)
- void `free_d3tensor` (double \*\*\*t, long nrl, long nrh, long ncl, long nch, long ndl, long ndh)

### 4.10.1 Macro Definition Documentation

4.10.1.1 #define `FREE_ARG` char\*

Definition at line 343 of file nrutil.c.

4.10.1.2 #define `NR_END` 1

Definition at line 342 of file nrutil.c.

## 4.10.2 Function Documentation

### 4.10.2.1 float\*\* convert\_matrix ( float \* *a*, long *nrl*, long *nrh*, long *ncl*, long *nch* )

Definition at line 509 of file nrutil.c.

### 4.10.2.2 unsigned char\* cvector ( long *nl*, long *nh* )

Definition at line 379 of file nrutil.c.

### 4.10.2.3 double\*\*\* d3tensor ( long *nrl*, long *nrh*, long *ncl*, long *nch*, long *ndl*, long *ndh* )

Definition at line 570 of file nrutil.c.

### 4.10.2.4 double\*\* dmatrix ( long *nrl*, long *nrh*, long *ncl*, long *nch* )

Definition at line 437 of file nrutil.c.

### 4.10.2.5 double\* dvector ( long *nl*, long *nh* )

Definition at line 401 of file nrutil.c.

### 4.10.2.6 float\*\*\* f3tensor ( long *nrl*, long *nrh*, long *ncl*, long *nch*, long *ndl*, long *ndh* )

Definition at line 533 of file nrutil.c.

### 4.10.2.7 void free\_convert\_matrix ( float \*\* *b*, long *nrl*, long *nrh*, long *ncl*, long *nch* )

Definition at line 681 of file nrutil.c.

### 4.10.2.8 void free\_cvector ( unsigned char \* *v*, long *nl*, long *nh* )

Definition at line 622 of file nrutil.c.

### 4.10.2.9 void free\_d3tensor ( double \*\*\* *t*, long *nrl*, long *nrh*, long *ncl*, long *nch*, long *ndl*, long *ndh* )

Definition at line 699 of file nrutil.c.

### 4.10.2.10 void free\_dmatrix ( double \*\* *m*, long *nrl*, long *nrh*, long *ncl*, long *nch* )

Definition at line 655 of file nrutil.c.

### 4.10.2.11 void free\_dvector ( double \* *v*, long *nl*, long *nh* )

Definition at line 638 of file nrutil.c.

### 4.10.2.12 void free\_f3tensor ( float \*\*\* *t*, long *nrl*, long *nrh*, long *ncl*, long *nch*, long *ndl*, long *ndh* )

Definition at line 689 of file nrutil.c.

4.10.2.13 void free\_imatrix ( int \*\* *m*, long *nrl*, long *nrh*, long *ncl*, long *nch* )

Definition at line 664 of file nrutil.c.

4.10.2.14 void free\_ivector ( int \* *v*, long *nl*, long *nh* )

Definition at line 614 of file nrutil.c.

4.10.2.15 void free\_lvector ( unsigned long \* *v*, long *nl*, long *nh* )

Definition at line 630 of file nrutil.c.

4.10.2.16 void free\_matrix ( float \*\* *m*, long *nrl*, long *nrh*, long *ncl*, long *nch* )

Definition at line 646 of file nrutil.c.

4.10.2.17 void free\_submatrix ( float \*\* *b*, long *nrl*, long *nrh*, long *ncl*, long *nch* )

Definition at line 673 of file nrutil.c.

4.10.2.18 void free\_vector ( float \* *v*, long *nl*, long *nh* )

Definition at line 606 of file nrutil.c.

4.10.2.19 int\*\* imatrix ( long *nrl*, long *nrh*, long *ncl*, long *nch* )

Definition at line 462 of file nrutil.c.

4.10.2.20 int\* ivector ( long *nl*, long *nh* )

Definition at line 368 of file nrutil.c.

4.10.2.21 unsigned long\* lvector ( long *nl*, long *nh* )

Definition at line 390 of file nrutil.c.

4.10.2.22 float\*\* matrix ( long *nrl*, long *nrh*, long *ncl*, long *nch* )

Definition at line 412 of file nrutil.c.

4.10.2.23 void nrerror ( error\_text )

Definition at line 345 of file nrutil.c.

4.10.2.24 float\*\* submatrix ( float \*\* *a*, long *oldrl*, long *oldrh*, long *oldcl*, long *oldch*, long *newrl*, long *newcl* )

Definition at line 488 of file nrutil.c.

4.10.2.25 float\* vector ( long *nl*, long *nh* )

Definition at line 357 of file nrutil.c.

## 4.11 src/fmg/nrutil.h File Reference

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

### Macros

- #define [SQR](#)(a) ((sqrarg=(a)) == 0.0 ? 0.0 : sqrarg\*sqrarg)
- #define [DSQR](#)(a) ((dsqrarg=(a)) == 0.0 ? 0.0 : dsqrarg\*dsqrarg)
- #define [DMAX](#)(a, b)
- #define [DMIN](#)(a, b)
- #define [FMAX](#)(a, b)
- #define [FMIN](#)(a, b)
- #define [LMAX](#)(a, b)
- #define [LMIN](#)(a, b)
- #define [IMAX](#)(a, b)
- #define [IMIN](#)(a, b)
- #define [SIGN](#)(a, b) ((b) >= 0.0 ? fabs(a) : -fabs(a))

### Functions

- void [nrerror](#) ()
- float \* [vector](#) ()
- float \*\* [matrix](#) ()
- float \*\* [submatrix](#) ()
- float \*\* [convert\\_matrix](#) ()
- float \*\*\* [f3tensor](#) ()
- double \* [dvector](#) ()
- double \*\* [dmatrix](#) ()
- int \* [ivector](#) ()
- int \*\* [imatrix](#) ()
- unsigned char \* [cvector](#) ()
- unsigned long \* [lvector](#) ()
- void [free\\_vector](#) ()
- void [free\\_dvector](#) ()
- void [free\\_ivector](#) ()
- void [free\\_cvector](#) ()
- void [free\\_lvector](#) ()
- void [free\\_matrix](#) ()
- void [free\\_submatrix](#) ()
- void [free\\_convert\\_matrix](#) ()
- void [free\\_dmatrix](#) ()
- void [free\\_imatrix](#) ()
- void [free\\_f3tensor](#) ()

### 4.11.1 Macro Definition Documentation

#### 4.11.1.1 #define DMAX( a, b )

**Value:**

```
(dmaxarg1=(a),dmaxarg2=(b),(dmaxarg1) > (dmaxarg2) ?\
(dmaxarg1) : (dmaxarg2))
```

Definition at line 11 of file nrutil.h.

#### 4.11.1.2 #define DMIN( a, b )

**Value:**

```
(dminarg1=(a),dminarg2=(b),(dminarg1) < (dminarg2) ?\
(dminarg1) : (dminarg2))
```

Definition at line 15 of file nrutil.h.

#### 4.11.1.3 #define DSQR( a )((dsqrarg=(a)) == 0.0 ? 0.0 : dsqrarg\*dsqrarg)

Definition at line 8 of file nrutil.h.

#### 4.11.1.4 #define FMAX( a, b )

**Value:**

```
(maxarg1=(a),maxarg2=(b),(maxarg1) > (maxarg2) ?\
(maxarg1) : (maxarg2))
```

Definition at line 19 of file nrutil.h.

#### 4.11.1.5 #define FMIN( a, b )

**Value:**

```
(minarg1=(a),minarg2=(b),(minarg1) < (minarg2) ?\
(minarg1) : (minarg2))
```

Definition at line 23 of file nrutil.h.

#### 4.11.1.6 #define IMAX( a, b )

**Value:**

```
(imaxarg1=(a),imaxarg2=(b),(imaxarg1) > (imaxarg2) ?\
(imaxarg1) : (imaxarg2))
```

Definition at line 35 of file nrutil.h.

#### 4.11.1.7 #define IMIN( a, b )

**Value:**

```
(iminarg1=(a),iminarg2=(b),(iminarg1) < (iminarg2) ?\
(iminarg1) : (iminarg2))
```

Definition at line 39 of file nrutil.h.



**4.11.1.8 #define LMAX( a, b )****Value:**

```
(lmaxarg1=(a),lmaxarg2=(b),(lmaxarg1) > (lmaxarg2) ?\
(lmaxarg1) : (lmaxarg2))
```

Definition at line 27 of file nrutil.h.

**4.11.1.9 #define LMIN( a, b )****Value:**

```
(lminarg1=(a),lminarg2=(b),(lminarg1) < (lminarg2) ?\
(lminarg1) : (lminarg2))
```

Definition at line 31 of file nrutil.h.

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

Definition at line 42 of file nrutil.h.

**4.11.1.11 #define SQR( a ) ((sqrarg=(a)) == 0.0 ? 0.0 : sqrarg\*sqrarg)**

Definition at line 5 of file nrutil.h.

**4.11.2 Function Documentation****4.11.2.1 float\*\* convert\_matrix ( )****4.11.2.2 unsigned char\* cvector ( )****4.11.2.3 double\*\* dmatrix ( )****4.11.2.4 double\* dvector ( )****4.11.2.5 float\*\*\* f3tensor ( )****4.11.2.6 void free\_convert\_matrix ( )****4.11.2.7 void free\_cvector ( )****4.11.2.8 void free\_dmatrix ( )****4.11.2.9 void free\_dvector ( )****4.11.2.10 void free\_f3tensor ( )****4.11.2.11 void free\_imatrix ( )****4.11.2.12 void free\_ivecator ( )****4.11.2.13 void free\_lvector ( )**

4.11.2.14 void free\_matrix ( )

4.11.2.15 void free\_submatrix ( )

4.11.2.16 void free\_vector ( )

4.11.2.17 int\*\* imatrix ( )

4.11.2.18 int\* ivecator ( )

4.11.2.19 unsigned long\* lvector ( )

4.11.2.20 float\*\* matrix ( )

4.11.2.21 void nrerror ( )

4.11.2.22 float\*\* submatrix ( )

4.11.2.23 float\* vector ( )

## 4.12 src/funct.h File Reference

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

### Functions

- void [convert](#) (void)
- void [readdata](#) (int arc, char \*arv[])
- double [erfcc](#) (double x)
- double [cumfprim](#) (double v0, int i)
- double [cumf](#) (double v0, int i)
- double [zet1](#) (int i)
- void [init\\_newpart](#) (void)
- void [calculate\\_flux](#) (void)
- void [diagm\\_open](#) (void)
- void [diagm\\_close](#) (void)
- void [printgrid](#) (int t)
- void [printdustshape](#) (void)
- void [printdustshapetime](#) (int t)
- void [printscales](#) (FILE \*fpointer)
- void [print\\_avpvel](#) (FILE \*fpointer, int k, int t, double [weight](#))
- void [printqdensity](#) (FILE \*fpointer, int t, double [weight](#))
- void [printdensity](#) (FILE \*fpointer, int k, int t, double [weight](#))
- void [printpotential](#) (FILE \*fpointer, int t, double [weight](#))
- void [printavpotential](#) (FILE \*fpointer, int t, double [weight](#))
- void [printefield](#) (FILE \*fpointer, int help, int t, double [weight](#))
- void [printKEall](#) (int t)
- void [printKE](#) (FILE \*fpointer, FILE \*fpointer2, int specie, int t, double [weight](#))
- void [printPE](#) (FILE \*fpointer, FILE \*fpointer2, int specie, int t, double [weight](#))
- void [printPETotal](#) (FILE \*fpointer, FILE \*fpointer2, int t, double [weight](#))
- void [printdustcharge](#) (FILE \*fpointer, int t, double [weight](#))
- void [printdustchargetime](#) (FILE \*fpointer, int t, double [weight](#))
- void [print\\_current](#) (int tid)
- void [printdth](#) (FILE \*fpointer, int t)

- void [printconvpot](#) (FILE \*fpointer, int t, int step)
- void [printpotcut](#) (FILE \*fpointer)
- double [printall](#) (FILE \*fpoint1, FILE \*fpoint2, int collect)
- void [pot\\_probes\\_init](#) (void)
- void [pot\\_probes](#) (int t)
- void [printpotdistribution](#) (int t)
- void [gen\\_bgnd](#) (void)
- void [maxw\\_dist](#) (int i, double [vthx](#), double [vthy](#), double driftx, double drifty)
- void [newparticles](#) (int timestep)
- void [init\\_primeroot](#) (double seed)
- double [primeroot](#) (void)
- int [initpartcheck](#) (double px, double py, double pz, double delta)
- int [initpartcheck\\_restart](#) (int dno, double px, double py, double pz, double delta)
- void [accel](#) (float factor)
- void [move](#) (int t)
- void [create\\_linkedlist](#) (void)
- void [memorygrid](#) (void)
- void [memorygridfree](#) (void)
- void [weighting1](#) (void)
- void [cleargrid](#) (void)
- void [cleargrid2](#) (void)
- void [gen\\_boundaries](#) (void)
- void [gen\\_probe](#) (int version)
- void [gen\\_dust3D](#) (int arc, char \*arv[])
- void [markgriddust](#) (void)
- void [checkcolcrossing](#) (int i)
- int [checkpointcrossing](#) (int i, int j)
- void [findabv](#) (int i)
- void [new\\_probe\\_potential](#) (double probepotential)
- void [normalize](#) (void)
- void [memorydust2\\_3D](#) (int j, int nc)
- void [memorydust1\\_3D](#) (int no)
- void [create\\_currentarrays](#) (void)
- void [startBfield](#) (void)
- void [gauss\\_seidel](#) (int nx, int ny, double tolerance)
- void [electric\\_field](#) (void)
- double [finddustvolume](#) (int arc, char \*arv[])
- double [dustarea](#) (int arc, char \*arv[])
- void [d\\_polygon](#) (int arc, char \*arv[])
- void [calculate\\_staticparameters](#) (int arc, char \*arv[])
- void [d\\_centreofmass\\_and\\_moml](#) (void)
- void [d\\_move](#) (int t)
- void [memoryduststatic](#) (int no)
- void [memorydpart](#) (int no, int dmax)
- void [weightingdust1](#) (int ko)
- void [chargeoncond](#) (int i)
- void [virtpart](#) (void)
- void [ortnormvec](#) (void)
- void [condsquares](#) (void)
- void [average\\_current](#) (void)
- void [findnewpotentials](#) (double interval, int collect, FILE \*fpoint1)
- void [redistribute](#) (double coeff)
- int [signof](#) (int a)
- double [smaller\\_same\\_sign](#) (double a, double b)
- void [printdragforce](#) (int timestep)

- void [drag\\_force\\_electric](#) (void)
- void [drag\\_force\\_direct](#) (double partvxnew, double partvynew, double partvznew, int particlespecie, int dno, double partxhit, double partyhit, double partzhit)
- void [mglin\\_destroy](#) (void)
- void [mglin\\_init](#) (int nx, int ny, int nz)
- void [mglin](#) (double \*u, int ncycle)
- void [dump](#) (long int t)
- long int [prog\\_restart](#) (void)
- void [shift\\_while\\_restarting](#) (int dno, double x, double y, double z)
- void [checkcond](#) (void)
- void [photonflux](#) (void)
- void [photoelectriceffect](#) (void)
- double \* [dvecmem](#) (long nl, long nh)
- int \* [ivecmem](#) (long nl, long nh)
- void [free\\_dvecmem](#) (double \*v, long nl, long nh)
- void [free\\_ivecmem](#) (int \*v, long nl, long nh)
- void [nnrerror](#) (char error\_text[])
- FILE \* [my\\_file\\_open](#) (const char \*filename, const char \*aarg)
- int [ix](#) (int off, int i, int j, int k)
- void [points\\_on\\_sphere](#) (int dustnumber, int numberofpoints)
- void [collisions\\_init](#) (void)
- void [collisions](#) (void)
- double [findsigma](#) (int i, double kinener)
- void [collide](#) (int i, int colltype, int j, double kener, double pvel)

### 4.12.1 Function Documentation

#### 4.12.1.1 void [accel](#) ( float *factor* )

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

#### 4.12.1.2 void [average\\_current](#) ( void )

Definition at line 1276 of file [dustg.c](#).

#### 4.12.1.3 void [calculate\\_flux](#) ( void )

Definition at line 69 of file [flux.c](#).

#### 4.12.1.4 void [calculate\\_staticparameters](#) ( int *arc*, char \* *arv*[] )

Definition at line 262 of file [dustg.c](#).

#### 4.12.1.5 void [chargeoncond](#) ( int *i* )

Definition at line 614 of file [dustg.c](#).

#### 4.12.1.6 void [checkcolcrossing](#) ( int *i* )

Definition at line 668 of file [grid.c](#).

#### 4.12.1.7 void checkcond ( void )

Definition at line 539 of file dustg.c.

#### 4.12.1.8 int checkpointcrossing ( int *i*, int *j* )

Definition at line 726 of file grid.c.

#### 4.12.1.9 void cleargrid ( void )

Definition at line 151 of file grid.c.

#### 4.12.1.10 void cleargrid2 ( void )

Definition at line 164 of file grid.c.

#### 4.12.1.11 void collide ( int *i*, int *colltype*, int *j*, double *kener*, double *pvel* )

Definition at line 244 of file collisions.c.

#### 4.12.1.12 void collisions ( void )

Definition at line 86 of file collisions.c.

#### 4.12.1.13 void collisions\_init ( void )

Definition at line 21 of file collisions.c.

#### 4.12.1.14 void condsquares ( void )

Definition at line 961 of file dustg.c.

#### 4.12.1.15 void convert ( void )

Definition at line 10 of file input.c.

#### 4.12.1.16 void create\_currentarrays ( void )

Definition at line 1114 of file grid.c.

#### 4.12.1.17 void create\_linkedlist ( void )

Definition at line 991 of file accel.c.

#### 4.12.1.18 double cumf ( double *v0*, int *i* )

Definition at line 34 of file flux.c.

4.12.1.19 `double cumfprim ( double v0, int i )`

Definition at line 23 of file flux.c.

4.12.1.20 `void d_centreofmass_and_moml ( void )`

Definition at line 351 of file dustg.c.

4.12.1.21 `void d_move ( int t )`

`tempy=sinphi*(csq[i][j].x2-dmass_centx[i])+cosphi*(csq[i][j].y2-dmass_centry[i]);`

Definition at line 9 of file dustg.c.

4.12.1.22 `void d_polygon ( int arc, char * arv[ ] )`

4.12.1.23 `void diagn_close ( void )`

Definition at line 111 of file diagn.c.

4.12.1.24 `void diagn_open ( void )`

Definition at line 24 of file diagn.c.

4.12.1.25 `void drag_force_direct ( double partvxnew, double partvynew, double partvznew, int particlespecie, int dno, double partxhit, double partyhit, double partzhit )`

Definition at line 1288 of file dustg.c.

4.12.1.26 `void drag_force_electric ( void )`

Definition at line 1399 of file dustg.c.

4.12.1.27 `void dump ( long int t )`

Definition at line 4 of file restart.c.

4.12.1.28 `double dustarea ( int arc, char * arv[ ] )`

Definition at line 1183 of file dustg.c.

4.12.1.29 `double* dvecmem ( long nl, long nh )`

Definition at line 27 of file shortcuts.c.

4.12.1.30 `void electric_field ( void )`

Definition at line 10 of file gauss.c.

**4.12.1.31 double erfcc ( double *x* )**

Definition at line 14 of file flux.c.

**4.12.1.32 void findabv ( int *i* )**

Definition at line 800 of file grid.c.

**4.12.1.33 double finddustvolume ( int *arc*, char \* *arv*[ ] )**

Definition at line 1078 of file dustg.c.

**4.12.1.34 void findnewpotentials ( double *interval*, int *collect*, FILE \* *fpoint1* )****4.12.1.35 double findsigma ( int *i*, double *kinener* )**

Definition at line 196 of file collisions.c.

**4.12.1.36 void free\_dvecmem ( double \* *v*, long *nl*, long *nh* )**

Definition at line 37 of file shortcuts.c.

**4.12.1.37 void free\_ivecmem ( int \* *v*, long *nl*, long *nh* )**

Definition at line 53 of file shortcuts.c.

**4.12.1.38 void gauss\_seidel ( int *nx*, int *ny*, double *tolerance* )****4.12.1.39 void gen\_bgnd ( void )**

Definition at line 10 of file generate.c.

**4.12.1.40 void gen\_boundaries ( void )**

Definition at line 299 of file grid.c.

**4.12.1.41 void gen\_dust3D ( int *arc*, char \* *arv*[ ] )**

close the dust input file

Definition at line 340 of file grid.c.

**4.12.1.42 void gen\_probe ( int *version* )****4.12.1.43 void init\_newpart ( void )**

Definition at line 46 of file flux.c.

**4.12.1.44 void init\_primeroot ( double *seed* )**

Definition at line 460 of file generate.c.

4.12.1.45 `int initpartcheck ( double px, double py, double pz, double delta )`

Definition at line 478 of file generate.c.

4.12.1.46 `int initpartcheck_restart ( int dno, double px, double py, double pz, double delta )`

Definition at line 599 of file generate.c.

4.12.1.47 `int* ivecmem ( long nl, long nh )`

Definition at line 43 of file shortcuts.c.

4.12.1.48 `int ix ( int off, int i, int j, int k )` `[inline]`

Definition at line 62 of file shortcuts.c.

4.12.1.49 `void markgriddust ( void )`

prepare lut for each column

Definition at line 541 of file grid.c.

4.12.1.50 `void maxw_dist ( int i, double vthx, double vthy, double driftx, double drifty )`

4.12.1.51 `void memorydpart ( int no, int dmax )`

Definition at line 287 of file dustg.c.

4.12.1.52 `void memorydust1_3D ( int no )`

Definition at line 828 of file grid.c.

4.12.1.53 `void memorydust2_3D ( int j, int nc )`

Definition at line 968 of file grid.c.

4.12.1.54 `void memoryduststatic ( int no )`

Definition at line 314 of file dustg.c.

4.12.1.55 `void memorygrid ( void )`

Definition at line 12 of file grid.c.

4.12.1.56 `void memorygridfree ( void )`

Definition at line 113 of file grid.c.



4.12.1.57 void `mglin` ( double \* *u*, int *ncycle* )

Definition at line 170 of file `fmg.c`.

4.12.1.58 void `mglin_destroy` ( void )

Definition at line 151 of file `fmg.c`.

4.12.1.59 void `mglin_init` ( int *nx*, int *ny*, int *nz* )

Definition at line 21 of file `fmg.c`.

4.12.1.60 void `move` ( int *t* )

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

4.12.1.61 FILE\* `my_file_open` ( const char \* *filename*, const char \* *aarg* )

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

4.12.1.62 void `new_probe_potential` ( double *probepotential* )

Definition at line 1009 of file `grid.c`.

4.12.1.63 void `newparticles` ( int *timestep* )

Definition at line 117 of file `generate.c`.

4.12.1.64 void `nnrerror` ( char *error\_text*[] )

4.12.1.65 void `normalize` ( void )

Definition at line 1022 of file `grid.c`.

4.12.1.66 void `ortnormvec` ( void )

Definition at line 890 of file `dustg.c`.

4.12.1.67 void `photoelectriceffect` ( void )

Definition at line 143 of file `photons.c`.

4.12.1.68 void `photonflux` ( void )

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

4.12.1.69 void `points_on_sphere` ( int *dustnumber*, int *numberofpoints* )

Definition at line 49 of file `spherical.c`.

4.12.1.70 void pot\_probes ( int *t* )

Definition at line 1390 of file diagn.c.

4.12.1.71 void pot\_probes\_init ( void )

Definition at line 1582 of file diagn.c.

4.12.1.72 double primeroot ( void )

Definition at line 448 of file generate.c.

4.12.1.73 void print\_avpvel ( FILE \* *fpointer*, int *k*, int *t*, double *weight* )

Definition at line 993 of file diagn.c.

4.12.1.74 void print\_current ( int *tid* )

Definition at line 1979 of file diagn.c.

4.12.1.75 double printall ( FILE \* *fpoint1*, FILE \* *fpoint2*, int *collect* )

4.12.1.76 void printavpotential ( FILE \* *fpointer*, int *t*, double *weight* )

Definition at line 1055 of file diagn.c.

4.12.1.77 void printconvpot ( FILE \* *fpointer*, int *t*, int *step* )

Definition at line 756 of file diagn.c.

4.12.1.78 void printdensity ( FILE \* *fpointer*, int *k*, int *t*, double *weight* )

Definition at line 844 of file diagn.c.

4.12.1.79 void printdragforce ( int *timestep* )

Definition at line 1544 of file dustg.c.

4.12.1.80 void printdth ( FILE \* *fpointer*, int *t* )

Definition at line 1305 of file diagn.c.

4.12.1.81 void printdustcharge ( FILE \* *fpointer*, int *t*, double *weight* )

Definition at line 1235 of file diagn.c.

4.12.1.82 void printdustchargetime ( FILE \* *fpointer*, int *t*, double *weight* )

Definition at line 1264 of file diagn.c.

4.12.1.83 void printdustshape ( void )

Definition at line 1346 of file diagn.c.

4.12.1.84 void printdustshapetime ( int t )

Definition at line 1368 of file diagn.c.

4.12.1.85 void printfield ( FILE \* *fpointer*, int *help*, int *t*, double *wieght* )

Definition at line 1070 of file diagn.c.

4.12.1.86 void printgrid ( int t )

Definition at line 177 of file diagn.c.

4.12.1.87 void printKE ( FILE \* *fpointer*, FILE \* *fpointer2*, int *specie*, int *t*, double *weight* )

Definition at line 1108 of file diagn.c.

4.12.1.88 void printKEall ( int t )

Definition at line 1093 of file diagn.c.

4.12.1.89 void printPE ( FILE \* *fpointer*, FILE \* *fpointer2*, int *specie*, int *t*, double *weight* )

Definition at line 1154 of file diagn.c.

4.12.1.90 void printPEtotal ( FILE \* *fpointer*, FILE \* *fpointer2*, int *t*, double *weight* )

Definition at line 1183 of file diagn.c.

4.12.1.91 void printpotcut ( FILE \* *fpointer* )

4.12.1.92 void printpotdistribution ( int t )

Definition at line 2023 of file diagn.c.

4.12.1.93 void printpotential ( FILE \* *fpointer*, int *t*, double *weight* )

Definition at line 1034 of file diagn.c.

4.12.1.94 void printqdensity ( FILE \* *fpointer*, int *t*, double *weight* )

Definition at line 803 of file diagn.c.

4.12.1.95 void printscale ( FILE \* *fpointer* )

Definition at line 777 of file diagn.c.

4.12.1.96 `long int prog_restart ( void )`

Definition at line 126 of file restart.c.

4.12.1.97 `void readdata ( int arc, char * arv[ ] )`

Definition at line 28 of file input.c.

4.12.1.98 `void redistribute ( double coeff )`

Definition at line 399 of file dustg.c.

4.12.1.99 `void shift_while_restarting ( int dno, double x, double y, double z )`

Definition at line 289 of file restart.c.

4.12.1.100 `int signof ( int a )` `[inline]`

Definition at line 1724 of file dustg.c.

4.12.1.101 `double smaller_same_sign ( double a, double b )` `[inline]`

Definition at line 1730 of file dustg.c.

4.12.1.102 `void startBfield ( void )`

Definition at line 138 of file grid.c.

4.12.1.103 `void virtpart ( void )`

Definition at line 725 of file dustg.c.

4.12.1.104 `void weighting1 ( void )`

Definition at line 181 of file grid.c.

4.12.1.105 `void weightingdust1 ( int ko )`

Definition at line 438 of file dustg.c.

4.12.1.106 `double zet1 ( int i )`

Definition at line 27 of file flux.c.

## 4.13 `src/gauss.c` File Reference

```
#include "const.h"
```

Include dependency graph for gauss.c:

## Functions

- void [electric\\_field](#) (void)

### 4.13.1 Function Documentation

#### 4.13.1.1 void [electric\\_field](#) ( void )

Definition at line 10 of file gauss.c.

## 4.14 src/generate.c File Reference

```
#include <stdlib.h>
#include <math.h>
#include "const.h"
Include dependency graph for generate.c:
```

## Functions

- void [gen\\_bgnd](#) (void)
- void [newparticles](#) (int timestep)
- double [primeroot](#) (void)
- void [init\\_primeroot](#) (double seed)
- int [initpartcheck](#) (double px, double py, double pz, double delta)
- int [initpartcheck\\_restart](#) (int dno, double px, double py, double pz, double delta)

### 4.14.1 Function Documentation

#### 4.14.1.1 void [gen\\_bgnd](#) ( void )

Definition at line 10 of file generate.c.

#### 4.14.1.2 void [init\\_primeroot](#) ( double *seed* )

Definition at line 460 of file generate.c.

#### 4.14.1.3 int [initpartcheck](#) ( double *px*, double *py*, double *pz*, double *delta* )

Definition at line 478 of file generate.c.

#### 4.14.1.4 int [initpartcheck\\_restart](#) ( int *dno*, double *px*, double *py*, double *pz*, double *delta* )

Definition at line 599 of file generate.c.

#### 4.14.1.5 void [newparticles](#) ( int *timestep* )

Definition at line 117 of file generate.c.

#### 4.14.1.6 double primeroot ( void )

Definition at line 448 of file generate.c.

## 4.15 src/grid.c File Reference

```
#include "const.h"
#include <math.h>
#include <stdlib.h>
Include dependency graph for grid.c:
```

### Functions

- void [memorygrid](#) (void)
- void [memorygridfree](#) (void)
- void [startBfield](#) ()
- void [cleargrid](#) ()
- void [cleargrid2](#) (void)
- void [weighting1](#) (void)
- void [gen\\_boundaries](#) (void)
- void [gen\\_dust3D](#) (int arc, char \*arv[])
- void [markgriddust](#) (void)
- void [checkcolcrossing](#) (int i)
- int [checkpointcrossing](#) (int i, int j)
- void [findabv](#) (int i)
- void [memorydust1\\_3D](#) (int no)
- void [memorydust2\\_3D](#) (int j, int nc)
- void [new\\_probe\\_potential](#) (double probepotential)
- void [normalize](#) (void)
- void [create\\_currentarrays](#) (void)

### 4.15.1 Function Documentation

#### 4.15.1.1 void checkcolcrossing ( int *i* )

Definition at line 668 of file grid.c.

#### 4.15.1.2 int checkpointcrossing ( int *i*, int *j* )

Definition at line 726 of file grid.c.

#### 4.15.1.3 void cleargrid ( void )

Definition at line 151 of file grid.c.

#### 4.15.1.4 void cleargrid2 ( void )

Definition at line 164 of file grid.c.

**4.15.1.5 void create\_currentarrays ( void )**

Definition at line 1114 of file grid.c.

**4.15.1.6 void findabv ( int i )**

Definition at line 800 of file grid.c.

**4.15.1.7 void gen\_boundaries ( void )**

Definition at line 299 of file grid.c.

**4.15.1.8 void gen\_dust3D ( int arc, char \* arv[] )**

close the dust input file

Definition at line 340 of file grid.c.

**4.15.1.9 void markgriddust ( void )**

pre pare lut for each column

Definition at line 541 of file grid.c.

**4.15.1.10 void memorydust1\_3D ( int no )**

Definition at line 828 of file grid.c.

**4.15.1.11 void memorydust2\_3D ( int j, int nc )**

Definition at line 968 of file grid.c.

**4.15.1.12 void memorygrid ( void )**

Definition at line 12 of file grid.c.

**4.15.1.13 void memorygridfree ( void )**

Definition at line 113 of file grid.c.

**4.15.1.14 void new\_probe\_potential ( double probepotential )**

Definition at line 1009 of file grid.c.

**4.15.1.15 void normalize ( void )**

Definition at line 1022 of file grid.c.

**4.15.1.16 void startBfield ( void )**

Definition at line 138 of file grid.c.

#### 4.15.1.17 void weighting1 ( void )

Definition at line 181 of file grid.c.

## 4.16 src/input.c File Reference

```
#include <math.h>
#include "const.h"
Include dependency graph for input.c:
```

### Functions

- void [convert](#) (void)
- void [readdata](#) (int *arc*, char \**arv*[ ])

#### 4.16.1 Function Documentation

##### 4.16.1.1 void convert ( void )

Definition at line 10 of file input.c.

##### 4.16.1.2 void readdata ( int *arc*, char \* *arv*[ ] )

Definition at line 28 of file input.c.

## 4.17 src/main.c File Reference

```
#include "const.h"
Include dependency graph for main.c:
```

### Functions

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

#### 4.17.1 Function Documentation

##### 4.17.1.1 int main ( int *argc*, char \* *argv*[ ] )

Definition at line 9 of file main.c.

## 4.18 src/photons.c File Reference

```
#include "const.h"
#include <stdlib.h>
Include dependency graph for photons.c:
```



## Functions

- void [photonflux](#) (void)
- void [photoelectriceffect](#) (void)

### 4.18.1 Function Documentation

#### 4.18.1.1 void photoelectriceffect ( void )

Definition at line 143 of file photons.c.

#### 4.18.1.2 void photonflux ( void )

Definition at line 4 of file photons.c.

## 4.19 src/restart.c File Reference

```
#include <stdio.h>
#include "const.h"
Include dependency graph for restart.c:
```

## Functions

- void [dump](#) (long int t)
- long int [prog\\_restart](#) ()
- void [shift\\_while\\_restarting](#) (int dno, double x, double y, double z)

### 4.19.1 Function Documentation

#### 4.19.1.1 void dump ( long int t )

Definition at line 4 of file restart.c.

#### 4.19.1.2 long int prog\_restart ( void )

Definition at line 126 of file restart.c.

#### 4.19.1.3 void shift\_while\_restarting ( int dno, double x, double y, double z )

Definition at line 289 of file restart.c.

## 4.20 src/shortcuts.c File Reference

```
#include "const.h"
#include "../fmg/nrutil.h"
#include <stddef.h>
#include <stdlib.h>
Include dependency graph for shortcuts.c:
```

## Macros

- `#define NR_ENDD 1`
- `#define FREE_ARGG char*`

## Functions

- `FILE * my_file_open` (const char \*filename, const char \*aarg)
- `double * dvecmem` (long nl, long nh)
- `void free_dvecmem` (double \*v, long nl, long nh)
- `int * ivecmem` (long nl, long nh)
- `void free_ivecmem` (int \*v, long nl, long nh)
- `int ix` (int off, int i, int j, int k)

### 4.20.1 Macro Definition Documentation

#### 4.20.1.1 `#define FREE_ARGG char*`

Definition at line 25 of file shortcuts.c.

#### 4.20.1.2 `#define NR_ENDD 1`

Definition at line 24 of file shortcuts.c.

### 4.20.2 Function Documentation

#### 4.20.2.1 `double* dvecmem ( long nl, long nh )`

Definition at line 27 of file shortcuts.c.

#### 4.20.2.2 `void free_dvecmem ( double * v, long nl, long nh )`

Definition at line 37 of file shortcuts.c.

#### 4.20.2.3 `void free_ivecmem ( int * v, long nl, long nh )`

Definition at line 53 of file shortcuts.c.

#### 4.20.2.4 `int* ivecmem ( long nl, long nh )`

Definition at line 43 of file shortcuts.c.

#### 4.20.2.5 `int ix ( int off, int i, int j, int k )` `[inline]`

Definition at line 62 of file shortcuts.c.

#### 4.20.2.6 `FILE* my_file_open ( const char * filename, const char * aarg )`

Definition at line 10 of file shortcuts.c.

## 4.21 src/spherical.c File Reference

```
#include "const.h"  
#include <math.h>  
#include <string.h>  
#include <stdlib.h>  
Include dependency graph for spherical.c:
```

### Functions

- void [points\\_on\\_sphere](#) (int dustnumber, int numberofpoints)

#### 4.21.1 Function Documentation

4.21.1.1 void [points\\_on\\_sphere](#) ( int *dustnumber*, int *numberofpoints* )

Definition at line 49 of file spherical.c.



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