

PlanetModel

5.3

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Module Index

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Chapter 2

Namespace Index

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Chapter 6

Module Documentation

6.1 Models

Modules

- [Environment](#)

6.1.1 Detailed Description

6.2 Environment

Modules

- [Planet](#)

6.2.1 Detailed Description

6.3 Planet

Files

- file [base_planet.hh](#)
Define the class BasePlanet.
- file [class_declarations.hh](#)
Forward declaration of classes defined in the planet model.
- file [planet.hh](#)
Planetary modeling constant parameter definitions.
- file [planet_messages.hh](#)
Define the class PlanetMessages, the class that specifies the message IDs used in the planet model.
- file [base_planet.cc](#)
Planet modeling class methods.
- file [planet.cc](#)
Planet modeling class methods.
- file [planet_messages.cc](#)
Implement the class PlanetMessages.

Namespaces

- [jeod](#)
Namespace jeod.

6.3.1 Detailed Description

Chapter 7

Namespace Documentation

7.1 jeod Namespace Reference

Namespace jeod.

Data Structures

- class [BasePlanet](#)
A [BasePlanet](#) contains the base data needed to model a planet in JEOD.
- class [Planet](#)
Describes a planet with mass and shape.
- class [Planet_default_data](#)
- class [Planet_earth_default_data](#)
- class [Planet_jupiter_default_data](#)
- class [Planet_mars_default_data](#)
- class [Planet_moon_default_data](#)
- class [Planet_sun_default_data](#)
- class [PlanetMessages](#)
Specifies the message IDs used in the planet model.

7.1.1 Detailed Description

Namespace jeod.

Chapter 8

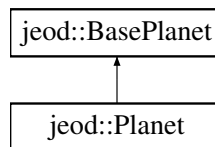
Data Structure Documentation

8.1 jeod::BasePlanet Class Reference

A [BasePlanet](#) contains the base data needed to model a planet in JEOD.

```
#include <base_planet.hh>
```

Inheritance diagram for jeod::BasePlanet:



Public Member Functions

- [BasePlanet](#) ()=default
- virtual [~BasePlanet](#) ()=default
- [BasePlanet](#) (const [BasePlanet](#) &)=delete
- [BasePlanet](#) & operator= (const [BasePlanet](#) &)=delete
- void [set_name](#) (const std::string &name_in)
Setter for the name.
- virtual void [set_alt_inertial](#) (const double trans[3][3])
Set the fixed transformation from J2000 to alt_inertial.
- virtual void [set_alt_inertial](#) (const double cp[3], const double ep[3])
Use the celestial and ecliptic poles to set the conventional fixed transformation from J2000 to alt_inertial.
- virtual void [set_alt_pfix](#) (const double trans[3][3])
Set the fixed transformation from pfix to alt_pfix.
- virtual void [calculate_alt_pfix](#) ()
Calculate the current transformation from J2000 to alt_pfix using the fixed transformation between pfix and alt_pfix.
- virtual void [register_planet](#) (BaseEphemeridesManager &ephem_manager)
Register a [BasePlanet](#) object with the Ephemerides Manager.

Data Fields

- `std::string name {""}`
Planet name.
- `GravitySource * grav_source {}`
The GravitySource corresponding to the same planet represented by this.
- `EphemerisRefFrame inertial`
The planet-centered J2000 pseudo-inertial frame associated with the planet represented by this.
- `EphemerisRefFrame alt_inertial`
A secondary pseudo-inertial frame which can be defined by the user to be equatorial for this planet.
- `EphemerisRefFrame pfix`
The planet-centered, planet-fixed Cartesian reference frame associated with the planet represented by this.
- `EphemerisRefFrame alt_pfix`
A secondary planet-fixed frame which can be defined by the user.

Protected Attributes

- `bool alt_inertial_set {}`
Flag to insure the alt_inertial frame is set only once.
- `double alt_pfix_transform [3][3] {IDENTITY_3X3}`
The transform from pfix to alt_pfix.
- `bool alt_pfix_set {}`
Flag to insure the alt_pfix transform never changed.

Friends

- `class InputProcessor`
- `void init_attrjeod__BasePlanet ()`

8.1.1 Detailed Description

A [BasePlanet](#) contains the base data needed to model a planet in JEOD.

A [BasePlanet](#) has a name, a planet-centered inertial reference frame, and a planet-centered planet-fixed reference frame. Details of the planet's shape and mass are in the [Planet](#) class, which derives from [BasePlanet](#).

Definition at line 89 of file `base_planet.hh`.

8.1.2 Constructor & Destructor Documentation

8.1.2.1 BasePlanet() [1/2]

```
jeod::BasePlanet::BasePlanet ( ) [default]
```

8.1.2.2 ~BasePlanet()

```
virtual jeod::BasePlanet::~~BasePlanet ( ) [virtual], [default]
```

8.1.2.3 BasePlanet() [2/2]

```
jeod::BasePlanet::BasePlanet (
    const BasePlanet & ) [delete]
```

8.1.3 Member Function Documentation

8.1.3.1 calculate_alt_pfix()

```
void jeod::BasePlanet::calculate_alt_pfix ( ) [virtual]
```

Calculate the current transformation from J2000 to alt_pfix using the fixed transformation between pfix and alt_pfix.

Assumptions and Limitations

calculates J2000 to alt_pfix using a fixed transformation from pfix to alt_pfix

Definition at line 119 of file base_planet.cc.

References alt_pfix, alt_pfix_transform, and pfix.

8.1.3.2 operator=()

```
BasePlanet& jeod::BasePlanet::operator= (
    const BasePlanet & ) [delete]
```

8.1.3.3 register_planet()

```
void jeod::BasePlanet::register_planet (
    BaseEphemeridesManager & ephemerides_manager ) [virtual]
```

Register a [BasePlanet](#) object with the Ephemerides Manager.

Parameters

<i>in</i> , <i>out</i>	<i>ephem_manager</i>	Ephemerides Manager
------------------------	----------------------	---------------------

Definition at line 130 of file base_planet.cc.

References alt_inertial, alt_pfix, inertial, name, jeod::PlanetMessages::name_error, and pfix.

Referenced by jeod::Planet::register_model().

8.1.3.4 set_alt_inertial() [1/2]

```
void jeod::BasePlanet::set_alt_inertial (
    const double trans[3][3] ) [virtual]
```

Set the fixed transformation from J2000 to alt_inertial.

Assumptions and Limitations

- Method only works once

Parameters

<i>in</i>	<i>trans</i>	trans J2000->alt_inertial
-----------	--------------	---------------------------

Definition at line 52 of file base_planet.cc.

References alt_inertial, and alt_inertial_set.

Referenced by jeod::Planet_mars_default_data::initialize(), and set_alt_inertial().

8.1.3.5 set_alt_inertial() [2/2]

```
void jeod::BasePlanet::set_alt_inertial (
    const double cp[3],
    const double ep[3] ) [virtual]
```

Use the celestial and ecliptic poles to set the conventional fixed transformation from J2000 to alt_inertial.

Assumptions and Limitations

- Method only works once
- Celestial and ecliptic poles are not the same

Parameters

in	<i>cp</i>	celestial pole unit vector
in	<i>ep</i>	Ecliptic pole unit vector

Definition at line 81 of file base_planet.cc.

References `set_alt_inertial()`.

8.1.3.6 `set_alt_pfix()`

```
void jeod::BasePlanet::set_alt_pfix (
    const double trans[3][3] ) [virtual]
```

Set the fixed transformation from pfix to alt_pfix.

Assumptions and Limitations

- Method only works once

Parameters

in	<i>trans</i>	trans pfix->alt_pfix
----	--------------	----------------------

Definition at line 100 of file base_planet.cc.

References `alt_pfix_set`, and `alt_pfix_transform`.

Referenced by `jeod::Planet_moon_default_data::initialize()`.

8.1.3.7 `set_name()`

```
void jeod::BasePlanet::set_name (
    const std::string & name_in ) [inline]
```

Setter for the name.

Definition at line 136 of file base_planet.hh.

8.1.4 Friends And Related Function Documentation

8.1.4.1 init_attrjeod__BasePlanet

```
void init_attrjeod__BasePlanet ( ) [friend]
```

8.1.4.2 InputProcessor

```
friend class InputProcessor [friend]
```

Definition at line 91 of file base_planet.hh.

8.1.5 Field Documentation

8.1.5.1 alt_inertial

```
EphemerisRefFrame jeod::BasePlanet::alt_inertial
```

A secondary pseudo-inertial frame which can be defined by the user to be equatorial for this planet.

trick_units(—)

Definition at line 113 of file base_planet.hh.

Referenced by register_planet(), and set_alt_inertial().

8.1.5.2 alt_inertial_set

```
bool jeod::BasePlanet::alt_inertial_set {} [protected]
```

Flag to insure the alt_inertial frame is set only once.

trick_units(—)

Definition at line 162 of file base_planet.hh.

Referenced by set_alt_inertial().

8.1.5.3 alt_pfix

```
EphemerisRefFrame jeod::BasePlanet::alt_pfix
```

A secondary planet-fixed frame which can be defined by the user.

trick_units(—)

Definition at line 124 of file base_planet.hh.

Referenced by calculate_alt_pfix(), and register_planet().

8.1.5.4 alt_pfix_set

```
bool jeod::BasePlanet::alt_pfix_set {} [protected]
```

Flag to insure the alt_pfix transform never changed.

trick_units(—)

Definition at line 172 of file base_planet.hh.

Referenced by set_alt_pfix().

8.1.5.5 alt_pfix_transform

```
double jeod::BasePlanet::alt_pfix_transform[3][3] {IDENTITY_3X3} [protected]
```

The transform from pfix to alt_pfix.

trick_units(—)

Definition at line 167 of file base_planet.hh.

Referenced by calculate_alt_pfix(), and set_alt_pfix().

8.1.5.6 grav_source

```
GravitySource* jeod::BasePlanet::grav_source {}
```

The GravitySource corresponding to the same planet represented by this.

trick_units(—)

Definition at line 101 of file base_planet.hh.

Referenced by jeod::Planet::initialize(), and jeod::Planet::register_model().

8.1.5.7 inertial

```
EphemerisRefFrame jeod::BasePlanet::inertial
```

The planet-centered J2000 pseudo-inertial frame associated with the planet represented by this.

trick_units(-)

Definition at line 107 of file base_planet.hh.

Referenced by jeod::Planet::register_model(), and register_planet().

8.1.5.8 name

```
std::string jeod::BasePlanet::name {""}
```

[Planet](#) name.

trick_units(-)

Definition at line 96 of file base_planet.hh.

Referenced by jeod::Planet_earth_default_data::initialize(), jeod::Planet_mars_default_data::initialize(), jeod::Planet_sun_default_data::initialize(), jeod::Planet_moon_default_data::initialize(), jeod::Planet_jupiter_default_data::initialize(), jeod::Planet::initialize(), jeod::Planet::register_model(), and register_planet().

8.1.5.9 prefix

```
EphemerisRefFrame jeod::BasePlanet::prefix
```

The planet-centered, planet-fixed Cartesian reference frame associated with the planet represented by this.

trick_units(-)

Definition at line 119 of file base_planet.hh.

Referenced by calculate_alt_prefix(), jeod::Planet::register_model(), and register_planet().

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

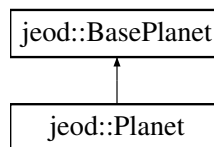
- [base_planet.hh](#)
- [base_planet.cc](#)

8.2 jeod::Planet Class Reference

Describes a planet with mass and shape.

```
#include <planet.hh>
```

Inheritance diagram for jeod::Planet:



Public Member Functions

- [Planet](#) ()=default
- [~Planet](#) () override=default
- [Planet](#) (const [Planet](#) &frame)=delete
- [Planet](#) & operator= (const [Planet](#) &frame)=delete
- void [register_model](#) (GravitySource &[grav_source](#), BaseDynManager &dyn_manager)
Register a [Planet](#) object with the Dynamics Manager.
- void [initialize](#) ()
Initialize a [Planet](#) object.

Data Fields

- double [r_eq](#) {}
Mean planet equatorial radius.
- double [r_pol](#) {}
Mean planet polar radius.
- double [e_ellipsoid](#) {}
[Planet](#) ellipsoid eccentricity, a value between 0 and 1.
- double [e_ellip_sq](#) {}
The square of the planet ellipsoid eccentricity.
- double [flat_coeff](#) {}
[Planet](#) ellipsoid flattening coefficient, a value between 0 and 1.
- double [flat_inv](#) {}
Inverse of the planet ellipsoid flattening constant above.

Friends

- class [InputProcessor](#)
- void [init_attrjeod__Planet](#) ()

Additional Inherited Members

8.2.1 Detailed Description

Describes a planet with mass and shape.

Definition at line 90 of file planet.hh.

8.2.2 Constructor & Destructor Documentation

8.2.2.1 Planet() [1/2]

```
jeod::Planet::Planet ( ) [default]
```

8.2.2.2 ~Planet()

```
jeod::Planet::~~Planet ( ) [override], [default]
```

8.2.2.3 Planet() [2/2]

```
jeod::Planet::Planet (
    const Planet & frame ) [delete]
```

8.2.3 Member Function Documentation

8.2.3.1 initialize()

```
void jeod::Planet::initialize ( )
```

Initialize a [Planet](#) object.

Assumptions and Limitations

- [Planet::register_model](#) has already been invoked.

Definition at line 79 of file planet.cc.

References [jeod::PlanetMessages::domain_error](#), [e_ellip_sq](#), [e_ellipsoid](#), [flat_coeff](#), [flat_inv](#), [jeod::BasePlanet::grav_source](#), [jeod::BasePlanet::name](#), [jeod::PlanetMessages::name_error](#), [r_eq](#), [r_pol](#), and [jeod::PlanetMessages::registration_error](#).

8.2.3.2 operator=()

```
Planet& jeod::Planet::operator= (
    const Planet & frame ) [delete]
```

8.2.3.3 register_model()

```
void jeod::Planet::register_model (
    GravitySource & grav_source_in,
    BaseDynManager & dyn_manager )
```

Register a [Planet](#) object with the Dynamics Manager.

Parameters

in, out	<i>grav_source↔ _in</i>	GravitySource object
in, out	<i>dyn_manager</i>	Dynamics manager

Definition at line 49 of file planet.cc.

References [jeod::BasePlanet::grav_source](#), [jeod::BasePlanet::inertial](#), [jeod::BasePlanet::name](#), [jeod::Planet↔
Messages::name_error](#), [jeod::BasePlanet::pfix](#), and [jeod::BasePlanet::register_planet\(\)](#).

8.2.4 Friends And Related Function Documentation

8.2.4.1 init_attrjeod__Planet

```
void init_attrjeod__Planet ( ) [friend]
```

8.2.4.2 InputProcessor

```
friend class InputProcessor [friend]
```

Definition at line 92 of file planet.hh.

8.2.5 Field Documentation

8.2.5.1 e_ellip_sq

```
double jeod::Planet::e_ellip_sq {}
```

The square of the planet ellipsoid eccentricity.

trick_units(-)

Definition at line 113 of file planet.hh.

Referenced by initialize().

8.2.5.2 e_ellipsoid

```
double jeod::Planet::e_ellipsoid {}
```

[Planet](#) ellipsoid eccentricity, a value between 0 and 1.

NOTE: This parameter relates to the planet's shape, not its orbit.trick_units(-)

Definition at line 108 of file planet.hh.

Referenced by initialize().

8.2.5.3 flat_coeff

```
double jeod::Planet::flat_coeff {}
```

[Planet](#) ellipsoid flattening coefficient, a value between 0 and 1.

The Earth's flattening, for example, is about 1/298.3.trick_units(-)

Definition at line 119 of file planet.hh.

Referenced by jeod::Planet_jupiter_default_data::initialize(), jeod::Planet_sun_default_data::initialize(), jeod::↔ Planet_mars_default_data::initialize(), jeod::Planet_moon_default_data::initialize(), and initialize().

8.2.5.4 flat_inv

```
double jeod::Planet::flat_inv {}
```

Inverse of the planet ellipsoid flattening constant above.

trick_units(-)

Definition at line 124 of file planet.hh.

Referenced by jeod::Planet_earth_default_data::initialize(), and initialize().

8.2.5.5 r_eq

```
double jeod::Planet::r_eq {}
```

Mean planet equatorial radius.

trick_units(m)

Definition at line 97 of file planet.hh.

Referenced by jeod::Planet_earth_default_data::initialize(), jeod::Planet_sun_default_data::initialize(), jeod::Planet_jupiter_default_data::initialize(), jeod::Planet_moon_default_data::initialize(), jeod::Planet_mars_default_data::initialize(), and initialize().

8.2.5.6 r_pol

```
double jeod::Planet::r_pol {}
```

Mean planet polar radius.

trick_units(m)

Definition at line 102 of file planet.hh.

Referenced by initialize().

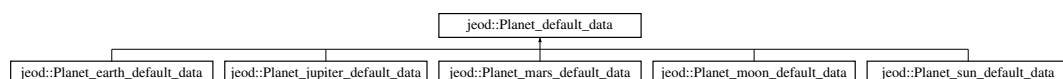
The documentation for this class was generated from the following files:

- [planet.hh](#)
- [planet.cc](#)

8.3 jeod::Planet_default_data Class Reference

```
#include <planet_default_data.hh>
```

Inheritance diagram for jeod::Planet_default_data:



Public Member Functions

- virtual void [initialize](#) ([Planet](#) *)=0
- virtual [~Planet_default_data](#) ()=default

8.3.1 Detailed Description

Definition at line 51 of file planet_default_data.hh.

8.3.2 Constructor & Destructor Documentation

8.3.2.1 `~Planet_default_data()`

```
virtual jeod::Planet_default_data::~~Planet_default_data ( ) [virtual], [default]
```

8.3.3 Member Function Documentation

8.3.3.1 `initialize()`

```
virtual void jeod::Planet_default_data::initialize (
    Planet * ) [pure virtual]
```

Implemented in [jeod::Planet_earth_default_data](#), [jeod::Planet_jupiter_default_data](#), [jeod::Planet_mars_default_data](#), [jeod::Planet_moon_default_data](#), and [jeod::Planet_sun_default_data](#).

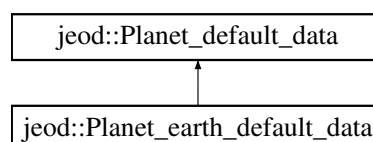
The documentation for this class was generated from the following file:

- [planet_default_data.hh](#)

8.4 jeod::Planet_earth_default_data Class Reference

```
#include <earth.hh>
```

Inheritance diagram for jeod::Planet_earth_default_data:



Public Member Functions

- void [initialize](#) ([Planet](#) *) override

8.4.1 Detailed Description

Definition at line 55 of file earth.hh.

8.4.2 Member Function Documentation

8.4.2.1 initialize()

```
void jeod::Planet_earth_default_data::initialize (
    Planet * Planet_ptr ) [override], [virtual]
```

Implements [jeod::Planet_default_data](#).

Definition at line 31 of file earth.cc.

References [jeod::Planet::flat_inv](#), [jeod::BasePlanet::name](#), and [jeod::Planet::r_eq](#).

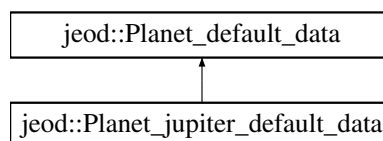
The documentation for this class was generated from the following files:

- [earth.hh](#)
- [earth.cc](#)

8.5 jeod::Planet_jupiter_default_data Class Reference

```
#include <jupiter.hh>
```

Inheritance diagram for [jeod::Planet_jupiter_default_data](#):



Public Member Functions

- void [initialize](#) ([Planet](#) *) override

8.5.1 Detailed Description

Definition at line 55 of file jupiter.hh.

8.5.2 Member Function Documentation

8.5.2.1 initialize()

```
void jeod::Planet_jupiter_default_data::initialize (
    Planet * Planet_ptr ) [override], [virtual]
```

Implements [jeod::Planet_default_data](#).

Definition at line 31 of file jupiter.cc.

References [jeod::Planet::flat_coeff](#), [jeod::BasePlanet::name](#), and [jeod::Planet::r_eq](#).

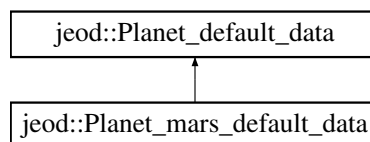
The documentation for this class was generated from the following files:

- [jupiter.hh](#)
- [jupiter.cc](#)

8.6 jeod::Planet_mars_default_data Class Reference

```
#include <mars.hh>
```

Inheritance diagram for [jeod::Planet_mars_default_data](#):



Public Member Functions

- void [initialize](#) ([Planet](#) *) override

8.6.1 Detailed Description

Definition at line 55 of file mars.hh.

8.6.2 Member Function Documentation

8.6.2.1 initialize()

```
void jeod::Planet_mars_default_data::initialize (
    Planet * Planet_ptr ) [override], [virtual]
```

Implements [jeod::Planet_default_data](#).

Definition at line 32 of file mars.cc.

References [jeod::Planet::flat_coeff](#), [jeod::BasePlanet::name](#), [jeod::Planet::r_eq](#), and [jeod::BasePlanet::set_alt_inertial\(\)](#).

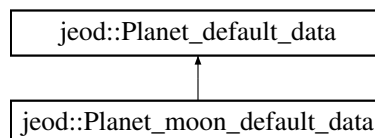
The documentation for this class was generated from the following files:

- [mars.hh](#)
- [mars.cc](#)

8.7 jeod::Planet_moon_default_data Class Reference

```
#include <moon.hh>
```

Inheritance diagram for jeod::Planet_moon_default_data:



Public Member Functions

- void [initialize](#) ([Planet](#) *) override

8.7.1 Detailed Description

Definition at line 55 of file moon.hh.

8.7.2 Member Function Documentation

8.7.2.1 initialize()

```
void jeod::Planet_moon_default_data::initialize (
    Planet * Planet_ptr ) [override], [virtual]
```

Implements [jeod::Planet_default_data](#).

Definition at line 31 of file moon.cc.

References [jeod::Planet::flat_coeff](#), [jeod::BasePlanet::name](#), [jeod::Planet::r_eq](#), and [jeod::BasePlanet::set_alt_prefix\(\)](#).

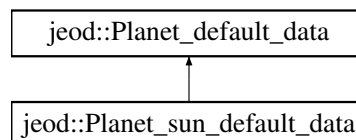
The documentation for this class was generated from the following files:

- [moon.hh](#)
- [moon.cc](#)

8.8 jeod::Planet_sun_default_data Class Reference

```
#include <sun.hh>
```

Inheritance diagram for [jeod::Planet_sun_default_data](#):



Public Member Functions

- void [initialize](#) ([Planet](#) *) override

8.8.1 Detailed Description

Definition at line 55 of file sun.hh.

8.8.2 Member Function Documentation

8.8.2.1 initialize()

```
void jeod::Planet_sun_default_data::initialize (
    Planet * Planet_ptr ) [override], [virtual]
```

Implements [jeod::Planet_default_data](#).

Definition at line 33 of file sun.cc.

References [jeod::Planet::flat_coeff](#), [jeod::BasePlanet::name](#), and [jeod::Planet::r_eq](#).

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

- [sun.hh](#)
- [sun.cc](#)

8.9 jeod::PlanetMessages Class Reference

Specifies the message IDs used in the planet model.

```
#include <planet_messages.hh>
```

Public Member Functions

- [PlanetMessages](#) ()=delete
- [PlanetMessages](#) (const [PlanetMessages](#) &)=delete
- [PlanetMessages](#) & operator= (const [PlanetMessages](#) &)=delete

Static Public Attributes

- static const char * [name_error](#) = "environment/planet/" "name_error"
Issued when the name is invalid.
- static const char * [registration_error](#) = "environment/planet/" "registration_error"
Issued when the model has not been properly registered/initialized.
- static const char * [domain_error](#) = "environment/planet/" "domain_error"
Issued when some value is invalid.

Friends

- class [InputProcessor](#)
- void [init_attrjeod__PlanetMessages](#) ()

8.9.1 Detailed Description

Specifies the message IDs used in the planet model.

Definition at line 81 of file planet_messages.hh.

8.9.2 Constructor & Destructor Documentation

8.9.2.1 PlanetMessages() [1/2]

```
jeod::PlanetMessages::PlanetMessages ( ) [delete]
```

8.9.2.2 PlanetMessages() [2/2]

```
jeod::PlanetMessages::PlanetMessages (
    const PlanetMessages & ) [delete]
```

8.9.3 Member Function Documentation

8.9.3.1 operator=()

```
PlanetMessages& jeod::PlanetMessages::operator= (
    const PlanetMessages & ) [delete]
```

8.9.4 Friends And Related Function Documentation

8.9.4.1 init_attrjeod__PlanetMessages

```
void init_attrjeod__PlanetMessages ( ) [friend]
```

8.9.4.2 InputProcessor

```
friend class InputProcessor [friend]
```

Definition at line 83 of file planet_messages.hh.

8.9.5 Field Documentation

8.9.5.1 domain_error

```
char const * jeod::PlanetMessages::domain_error = "environment/planet/" "domain_error" [static]
```

Issued when some value is invalid.

trick_units(−)

Definition at line 98 of file planet_messages.hh.

Referenced by jeod::Planet::initialize().

8.9.5.2 name_error

```
char const * jeod::PlanetMessages::name_error = "environment/planet/" "name_error" [static]
```

Issued when the name is invalid.

trick_units(−)

Definition at line 88 of file planet_messages.hh.

Referenced by jeod::Planet::initialize(), jeod::Planet::register_model(), and jeod::BasePlanet::register_planet().

8.9.5.3 registration_error

```
char const * jeod::PlanetMessages::registration_error = "environment/planet/" "registration_↵  
error" [static]
```

Issued when the model has not been properly registered/initialized.

trick_units(−)

Definition at line 93 of file planet_messages.hh.

Referenced by jeod::Planet::initialize().

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

- [planet_messages.hh](#)
- [planet_messages.cc](#)

Chapter 9

File Documentation

9.1 base_planet.cc File Reference

Planet modeling class methods.

```
#include <cstddef>
#include <cstring>
#include "environment/ephemerides/ephem_manager/include/base_ephem_manager.↵
hh"
#include "utils/math/include/vector3.hh"
#include "utils/memory/include/jeod_alloc.hh"
#include "utils/message/include/message_handler.hh"
#include "../include/base_planet.hh"
#include "../include/planet_messages.hh"
```

Namespaces

- [jeod](#)

Namespace jeod.

9.1.1 Detailed Description

Planet modeling class methods.

9.2 base_planet.hh File Reference

Define the class BasePlanet.

```
#include "environment/ephemerides/ephem_interface/include/ephem_ref_frame.↵
hh"
#include "environment/gravity/include/gravity_source.hh"
#include "utils/sim_interface/include/jeod_class.hh"
#include <string>
#include <utility>
#include "utils/math/include/macro_def.hh"
#include "utils/math/include/macro_undef.hh"
```

Data Structures

- class [jeod::BasePlanet](#)

A [BasePlanet](#) contains the base data needed to model a planet in JEOD.

Namespaces

- [jeod](#)

Namespace *jeod*.

9.2.1 Detailed Description

Define the class BasePlanet.

9.3 [class_declarations.hh](#) File Reference

Forward declaration of classes defined in the planet model.

Namespaces

- [jeod](#)

Namespace *jeod*.

9.3.1 Detailed Description

Forward declaration of classes defined in the planet model.

9.4 [earth.cc](#) File Reference

```
#include "environment/planet/include/base_planet.hh"
#include "environment/planet/include/planet.hh"
#include "utils/named_item/include/named_item.hh"
#include "../include/earth.hh"
```

Namespaces

- [jeod](#)

Namespace *jeod*.

Macros

- `#define` [JEOD_FRIEND_CLASS](#) Planet_earth_default_data

9.4.1 Macro Definition Documentation

9.4.1.1 JEOD_FRIEND_CLASS

```
#define JEOD_FRIEND_CLASS Planet_earth_default_data
```

Definition at line 17 of file earth.cc.

9.5 earth.hh File Reference

```
#include "planet_default_data.hh"
```

Data Structures

- class [jeod::Planet_earth_default_data](#)

Namespaces

- [jeod](#)
Namespace jeod.

9.6 jupiter.cc File Reference

```
#include "environment/planet/include/base_planet.hh"  
#include "environment/planet/include/planet.hh"  
#include "utils/named_item/include/named_item.hh"  
#include "../include/jupiter.hh"
```

Namespaces

- [jeod](#)
Namespace jeod.

Macros

- #define [JEOD_FRIEND_CLASS](#) Planet_jupiter_default_data

9.6.1 Macro Definition Documentation

9.6.1.1 JEOD_FRIEND_CLASS

```
#define JEOD_FRIEND_CLASS Planet_jupiter_default_data
```

Definition at line 17 of file jupiter.cc.

9.7 jupiter.hh File Reference

```
#include "planet_default_data.hh"
```

Data Structures

- class [jeod::Planet_jupiter_default_data](#)

Namespaces

- [jeod](#)
Namespace jeod.

9.8 mars.cc File Reference

```
#include "environment/planet/include/base_planet.hh"  
#include "environment/planet/include/planet.hh"  
#include "utils/named_item/include/named_item.hh"  
#include "../include/mars.hh"
```

Namespaces

- [jeod](#)
Namespace jeod.

Macros

- [#define JEOD_FRIEND_CLASS Planet_mars_default_data](#)

9.8.1 Macro Definition Documentation

9.8.1.1 JEOD_FRIEND_CLASS

```
#define JEOD_FRIEND_CLASS Planet_mars_default_data
```

Definition at line 18 of file mars.cc.

9.9 mars.hh File Reference

```
#include "planet_default_data.hh"
```

Data Structures

- class [jeod::Planet_mars_default_data](#)

Namespaces

- [jeod](#)
Namespace jeod.

9.10 moon.cc File Reference

```
#include "environment/planet/include/base_planet.hh"  
#include "environment/planet/include/planet.hh"  
#include "utils/named_item/include/named_item.hh"  
#include "../include/moon.hh"
```

Namespaces

- [jeod](#)
Namespace jeod.

Macros

- [#define JEOD_FRIEND_CLASS Planet_moon_default_data](#)

9.10.1 Macro Definition Documentation

9.10.1.1 JEOD_FRIEND_CLASS

```
#define JEOD_FRIEND_CLASS Planet_moon_default_data
```

Definition at line 17 of file moon.cc.

9.11 moon.hh File Reference

```
#include "planet_default_data.hh"
```

Data Structures

- class [jeod::Planet_moon_default_data](#)

Namespaces

- [jeod](#)

Namespace jeod.

9.12 planet.cc File Reference

Planet modeling class methods.

```
#include <cmath>
#include <cstdlib>
#include <cstring>
#include "dynamics/dyn_manager/include/base_dyn_manager.hh"
#include "utils/message/include/message_handler.hh"
#include "../include/planet.hh"
#include "../include/planet_messages.hh"
```

Namespaces

- [jeod](#)

Namespace jeod.

9.12.1 Detailed Description

Planet modeling class methods.

9.13 planet.hh File Reference

Planetary modeling constant parameter definitions.

```
#include "utils/sim_interface/include/jeod_class.hh"
#include "base_planet.hh"
#include "environment/gravity/include/gravity_source.hh"
```

Data Structures

- class [jeod::Planet](#)
Describes a planet with mass and shape.

Namespaces

- [jeod](#)
Namespace jeod.

9.13.1 Detailed Description

Planetary modeling constant parameter definitions.

9.14 planet_default_data.hh File Reference

Data Structures

- class [jeod::Planet_default_data](#)

Namespaces

- [jeod](#)
Namespace jeod.

9.15 planet_messages.cc File Reference

Implement the class PlanetMessages.

```
#include "utils/message/include/make_message_code.hh"
#include "../include/planet_messages.hh"
```

Namespaces

- [jeod](#)

Namespace jeod.

Macros

- `#define MAKE_PLANET_MESSAGE_CODE(id) JEOD_MAKE_MESSAGE_CODE(PlanetMessages, "environment/planet/", id)`

9.15.1 Detailed Description

Implement the class PlanetMessages.

9.15.2 Macro Definition Documentation

9.15.2.1 MAKE_PLANET_MESSAGE_CODE

```
#define MAKE_PLANET_MESSAGE_CODE(  
    id ) JEOD_MAKE_MESSAGE_CODE(PlanetMessages, "environment/planet/", id)
```

Definition at line 43 of file planet_messages.cc.

9.16 planet_messages.hh File Reference

Define the class PlanetMessages, the class that specifies the message IDs used in the planet model.

```
#include "utils/sim_interface/include/jeod_class.hh"
```

Data Structures

- class [jeod::PlanetMessages](#)

Specifies the message IDs used in the planet model.

Namespaces

- [jeod](#)

Namespace jeod.

9.16.1 Detailed Description

Define the class PlanetMessages, the class that specifies the message IDs used in the planet model.

9.17 sun.cc File Reference

```
#include "environment/planet/include/base_planet.hh"
#include "environment/planet/include/planet.hh"
#include "utils/named_item/include/named_item.hh"
#include "../include/sun.hh"
```

Namespaces

- [jeod](#)
Namespace jeod.

Macros

- `#define` [JEOD_FRIEND_CLASS](#) Planet_sun_default_data

9.17.1 Macro Definition Documentation

9.17.1.1 JEOD_FRIEND_CLASS

```
#define JEOD_FRIEND_CLASS Planet_sun_default_data
```

Definition at line 19 of file sun.cc.

9.18 sun.hh File Reference

```
#include "planet_default_data.hh"
```

Data Structures

- class [jeod::Planet_sun_default_data](#)

Namespaces

- [jeod](#)
Namespace jeod.

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