

LVLHFrameModel

5.0

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Module Index

1.1 Modules

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Chapter 2

Namespace Index

2.1 Namespace List

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Chapter 3

Data Structure Index

3.1 Data Structures

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4.1 File List

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Chapter 5

Module Documentation

5.1 Models

Modules

- [Utils](#)

5.1.1 Detailed Description

5.2 Utils

Modules

- [LvHFrame](#)

5.2.1 Detailed Description

5.3 LvlhFrame

Files

- file [lvlh_frame.hh](#)
Define the class LvlhFrame, the class used to represent a local-vertical, local-horizontal reference frame associated with a subject DynBody.
- file [lvlh_frame_messages.hh](#)
Define the class LvlhFrameMessages, the class that specifies the message IDs used in the LvlhFrame model.
- file [lvlh_type.hh](#)
Define the class LvlhType, which identifies the type of LVLH desired to be calculated.
- file [lvlh_frame.cc](#)
Define methods for the LVLH reference frame class.
- file [lvlh_frame_messages.cc](#)
Implement the class LvlhFrameMessages.

Namespaces

- [jeod](#)
Namespace jeod.

Macros

- `#define PATH "utils/lvlh_frame/"`

5.3.1 Detailed Description

5.3.2 Macro Definition Documentation

5.3.2.1 `#define PATH "utils/lvlh_frame/"`

Definition at line 32 of file `lvlh_frame_messages.cc`.

Chapter 6

Namespace Documentation

6.1 jeod Namespace Reference

Namespace jeod.

Data Structures

- class [LvIhFrame](#)
The class used to represent an LVLH reference frame associated with a subject DynBody.
- class [LvIhFrameMessages](#)
The class that specifies the message IDs used in the [LvIhFrame](#) model.
- class [LvIhType](#)
The class used to identify the type of LVLH desired.

6.1.1 Detailed Description

Namespace jeod.

Chapter 7

Data Structure Documentation

7.1 jeod::LvlhFrame Class Reference

The class used to represent an LVLH reference frame associated with a subject DynBody.

```
#include <lvlh_frame.hh>
```

Public Member Functions

- [LvlhFrame](#) ()
Construct an [LvlhFrame](#) object.
- [~LvlhFrame](#) ()
Destruct an [LvlhFrame](#) object.
- void [initialize](#) (DynManager &dyn_manager)
Begin initialization of an [LvlhFrame](#).
- void [update](#) ()
Update the state.
- void [set_subject_name](#) (const std::string new_name)
Set the `subject_name` to the supplied value.
- void [set_planet_name](#) (const std::string new_name)
Set the `planet_name` to the supplied value.
- void [set_subject_frame](#) (RefFrame &new_frame)
Set the `subject_frame` to the supplied value.
- void [set_planet](#) (BasePlanet &new_planet)
Set the planet whose PCI frame will be the reference for LVLH.

Data Fields

- RefFrame [frame](#)
The LVLH frame defined by the subject frame's motion with respect to the reference planet.
- std::string [subject_name](#)
The frame whose motion defines LVLH.
- std::string [planet_name](#)
The planet used as reference for the LVLH frame.

Protected Member Functions

- void [compute_lvlh_frame](#) (const RefFrameTrans &rel_trans)

Update the state of the LVLH frame wrt its parent.

Protected Attributes

- RefFrame * [subject_frame](#)

The (moving) frame specified with subject_name.

- RefFrame * [planet_centered_inertial](#)

The inertial frame with origin at the center of the specified planet.

Private Member Functions

- [LvhlFrame](#) (const [LvhlFrame](#) &)
- [LvhlFrame](#) & [operator=](#) (const [LvhlFrame](#) &)

Private Attributes

- DynManager * [local_dm](#)

A local pointer to the dynamics manager needed for clean-up.

Friends

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

7.1.1 Detailed Description

The class used to represent an LVLH reference frame associated with a subject DynBody.

Definition at line 49 of file [lvlh_frame.hh](#).

7.1.2 Constructor & Destructor Documentation

7.1.2.1 [jeod::LvhlFrame::LvhlFrame](#) (void)

Construct an [LvhlFrame](#) object.

Definition at line 52 of file [lvlh_frame.cc](#).

7.1.2.2 [jeod::LvhlFrame::~~LvhlFrame](#) (void)

Destruct an [LvhlFrame](#) object.

Definition at line 70 of file [lvlh_frame.cc](#).

References [frame](#), [local_dm](#), [planet_centered_inertial](#), and [subject_frame](#).

7.1.2.3 jeod::LvlhFrame::LvlhFrame (const LvlhFrame &) [private]

7.1.3 Member Function Documentation

7.1.3.1 void jeod::LvlhFrame::compute_lvlh_frame (const RefFrameTrans & *rel_trans*) [protected]

Update the state of the LVLH frame wrt its parent.

Parameters

<i>in</i>	<i>rel_trans</i>	Planet relative state
-----------	------------------	-----------------------

Definition at line 268 of file `lvlh_frame.cc`.

References `frame`.

Referenced by `update()`.

7.1.3.2 void jeod::LvIhFrame::initialize (DynManager & *dyn_manager*)

Begin initialization of an [LvIhFrame](#).

Parameters

<i>in, out</i>	<i>dyn_manager</i>	Dynamics manager
----------------	--------------------	------------------

Definition at line 97 of file `lvlh_frame.cc`.

References `frame`, `jeod::LvIhFrameMessages::invalid_configuration`, `jeod::LvIhFrameMessages::invalid_name`, `local_dm`, `planet_centered_inertial`, `planet_name`, `subject_frame`, and `subject_name`.

7.1.3.3 LvIhFrame& jeod::LvIhFrame::operator= (const LvIhFrame &) [private]**7.1.3.4 void jeod::LvIhFrame::set_planet (BasePlanet & *new_planet*)**

Set the planet whose PCI frame will be the reference for LVLH.

Parameters

<i>in</i>	<i>new_planet</i>	new planet.
-----------	-------------------	-------------

Definition at line 256 of file `lvlh_frame.cc`.

References `planet_centered_inertial`.

7.1.3.5 void jeod::LvIhFrame::set_planet_name (const std::string *new_name*)

Set the `planet_name` to the supplied value.

Parameters

<i>in</i>	<i>new_name</i>	new name.
-----------	-----------------	-----------

Definition at line 244 of file `lvlh_frame.cc`.

References `planet_name`.

7.1.3.6 void jeod::LvIhFrame::set_subject_frame (RefFrame & *new_frame*)

Set the `subject_frame` to the supplied value.

Parameters

<i>in</i>	<i>new_frame</i>	new frame.
-----------	------------------	------------

Definition at line 232 of file `lvlh_frame.cc`.

References `subject_frame`.

7.1.3.7 void jeod::LvlhFrame::set_subject_name (const std::string *new_name*)

Set the subject_name to the supplied value.

Parameters

<i>in</i>	<i>new_name</i>	new name.
-----------	-----------------	-----------

Definition at line 221 of file `lvlh_frame.cc`.

References `subject_name`.

7.1.3.8 void jeod::LvlhFrame::update (void)

Update the state.

Definition at line 191 of file `lvlh_frame.cc`.

References `compute_lvlh_frame()`, `frame`, `planet_centered_inertial`, and `subject_frame`.

7.1.4 Friends And Related Function Documentation**7.1.4.1 void init_attrjeod__LvlhFrame () [friend]****7.1.4.2 friend class InputProcessor [friend]**

Definition at line 51 of file `lvlh_frame.hh`.

7.1.5 Field Documentation**7.1.5.1 RefFrame jeod::LvlhFrame::frame**

The LVLH frame defined by the subject frame's motion with respect to the reference planet.

`trick_units(-)`

Definition at line 60 of file `lvlh_frame.hh`.

Referenced by `compute_lvlh_frame()`, `initialize()`, `update()`, and `~LvlhFrame()`.

7.1.5.2 DynManager* jeod::LvlhFrame::local_dm [private]

A local pointer to the dynamics manager needed for clean-up.

`trick_units(-)`

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

Referenced by `initialize()`, and `~LvlhFrame()`.

7.1.5.3 RefFrame* jeod::LvlhFrame::planet_centered_inertial [protected]

The inertial frame with origin at the center of the specified planet.

`trick_units(-)`

Definition at line 82 of file `lvlh_frame.hh`.

Referenced by `initialize()`, `set_planet()`, `update()`, and `~LvlhFrame()`.

7.1.5.4 std::string jeod::LvlhFrame::planet_name

The planet used as reference for the LVLH frame.

`trick_units(-)`

Definition at line 70 of file lvlh_frame.hh.

Referenced by initialize(), and set_planet_name().

7.1.5.5 RefFrame* jeod::LvlhFrame::subject_frame [protected]

The (moving) frame specified with subject_name.

trick_units(-)

Definition at line 77 of file lvlh_frame.hh.

Referenced by initialize(), set_subject_frame(), update(), and ~LvlhFrame().

7.1.5.6 std::string jeod::LvlhFrame::subject_name

The frame whose motion defines LVLH.

Can be on a vehicle or not.trick_units(-)

Definition at line 65 of file lvlh_frame.hh.

Referenced by initialize(), and set_subject_name().

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

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

7.2 jeod::LvlhFrameMessages Class Reference

The class that specifies the message IDs used in the [LvlhFrame](#) model.

```
#include <lvlh_frame_messages.hh>
```

Static Public Attributes

- static char const * [fatal_error](#)
Issued when performing an action results in an error return from the method performing the action.
- static char const * [illegal_value](#)
Issued when a simple type (e.g.
- static char const * [invalid_name](#)
Issued when a name is invalid (NULL, empty, or does not name an object of the specified type).
- static char const * [invalid_configuration](#)
Issued when insufficient information has been specified prior to initialization.
- static char const * [invalid_object](#)
Issued when a pointer points to an object of the wrong type.
- static char const * [null_pointer](#)
Error issued when a pointer is required but was not provided.
- static char const * [trace](#)
Debug message issued to trace [LvlhFrame](#) actions.
- static char const * [divide_by_zero](#)
Fatal message when a divide by zero is encountered.

Private Member Functions

- [LvIhFrameMessages](#) (void)
- [LvIhFrameMessages](#) (const [LvIhFrameMessages](#) &)
- [LvIhFrameMessages](#) & operator= (const [LvIhFrameMessages](#) &)

Friends

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

7.2.1 Detailed Description

The class that specifies the message IDs used in the [LvIhFrame](#) model.

Definition at line 47 of file `lvIh_frame_messages.hh`.

7.2.2 Constructor & Destructor Documentation

7.2.2.1 `jeod::LvIhFrameMessages::LvIhFrameMessages (void) [private]`

7.2.2.2 `jeod::LvIhFrameMessages::LvIhFrameMessages (const LvIhFrameMessages &) [private]`

7.2.3 Member Function Documentation

7.2.3.1 `LvIhFrameMessages& jeod::LvIhFrameMessages::operator= (const LvIhFrameMessages &) [private]`

7.2.4 Friends And Related Function Documentation

7.2.4.1 `void init_attrjeod__LvIhFrameMessages () [friend]`

7.2.4.2 `friend class InputProcessor [friend]`

Definition at line 50 of file `lvIh_frame_messages.hh`.

7.2.5 Field Documentation

7.2.5.1 `char const * jeod::LvIhFrameMessages::divide_by_zero [static]`

Initial value:

```
=
    "utils/lvIh_frame/" "divide_by_zero"
```

Fatal message when a divide by zero is encountered.

`trick_units(-)`

Definition at line 96 of file `lvIh_frame_messages.hh`.

7.2.5.2 `char const * jeod::LvIhFrameMessages::fatal_error [static]`

Initial value:

```
=
    "utils/lvlh_frame/" "fatal_error"
```

Issued when performing an action results in an error return from the method performing the action.

trick_units(–)

Definition at line 59 of file lvlh_frame_messages.hh.

7.2.5.3 char const * jeod::LvlhFrameMessages::illegal_value [static]

Initial value:

```
=
    "utils/lvlh_frame/" "illegal_value"
```

Issued when a simple type (e.g.

an enum) has an illegal value.trick_units(–)

Definition at line 64 of file lvlh_frame_messages.hh.

7.2.5.4 char const * jeod::LvlhFrameMessages::invalid_configuration [static]

Initial value:

```
=
    "utils/lvlh_frame/" "invalid_configuration"
```

Issued when insufficient information has been specified prior to initialization.

trick_units(–)

Definition at line 76 of file lvlh_frame_messages.hh.

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

7.2.5.5 char const * jeod::LvlhFrameMessages::invalid_name [static]

Initial value:

```
=
    "utils/lvlh_frame/" "invalid_name"
```

Issued when a name is invalid (NULL, empty, or does not name an object of the specified type).

trick_units(–)

Definition at line 70 of file lvlh_frame_messages.hh.

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

7.2.5.6 char const * jeod::LvlhFrameMessages::invalid_object [static]

Initial value:

```
=
    "utils/lvlh_frame/" "invalid_object"
```

Issued when a pointer points to an object of the wrong type.

trick_units(–)

Definition at line 81 of file lvlh_frame_messages.hh.

7.2.5.7 `char const * jeod::LvlhFrameMessages::null_pointer` [static]

Initial value:

```
=
    "utils/lvlh_frame/" "null_pointer"
```

Error issued when a pointer is required but was not provided.

trick_units(-)

Definition at line 86 of file `lvlh_frame_messages.hh`.

7.2.5.8 `char const * jeod::LvlhFrameMessages::trace` [static]

Initial value:

```
=
    "utils/lvlh_frame/" "trace"
```

Debug message issued to trace [LvlhFrame](#) actions.

trick_units(-)

Definition at line 91 of file `lvlh_frame_messages.hh`.

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

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

7.3 `jeod::LvlhType` Class Reference

The class used to identify the type of LVLH desired.

```
#include <lvlh_type.hh>
```

Public Types

- enum [Type](#) { [Rectilinear](#) = 0, [CircularCurvilinear](#) = 1, [EllipticalCurvilinear](#) = 2 }
- An enumeration to specify the type of LVLH coordinates to use, whether rectilinear, circular curvilinear, or elliptical curvilinear.*

Public Member Functions

- [LvlhType](#) (void)
- Default constructor.*

Data Fields

- [Type](#) value
- Indicates type of LVLH coordinates desired.*

Friends

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

7.3.1 Detailed Description

The class used to identify the type of LVLH desired.

Definition at line 44 of file lvlh_type.hh.

7.3.2 Member Enumeration Documentation

7.3.2.1 enum jeod::LvlhType::Type

An enumeration to specify the type of LVLH coordinates to use, whether rectilinear, circular curvilinear, or elliptical curvilinear.

As of March 2015, elliptical is not implemented.

Enumerator

Rectilinear

CircularCurvilinear

EllipticalCurvilinear

Definition at line 57 of file lvlh_type.hh.

7.3.3 Constructor & Destructor Documentation

7.3.3.1 jeod::LvlhType::LvlhType(void) [inline]

Default constructor.

Definition at line 85 of file lvlh_type.hh.

References Rectilinear, and value.

7.3.4 Friends And Related Function Documentation

7.3.4.1 void init_attrjeod__LvlhType() [friend]

7.3.4.2 friend class InputProcessor [friend]

Definition at line 46 of file lvlh_type.hh.

7.3.5 Field Documentation

7.3.5.1 Type jeod::LvlhType::value

Indicates type of LVLH coordinates desired.

Default is rectilinear.trick_units(-)

Definition at line 76 of file lvlh_type.hh.

Referenced by LvlhType().

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

- [lvlh_type.hh](#)

Chapter 8

File Documentation

8.1 `lvlh_frame.cc` File Reference

Define methods for the LVLH reference frame class.

```
#include <cstdlib>
#include "dynamics/dyn_manager/include/dyn_manager.hh"
#include "environment/planet/include/base_planet.hh"
#include "utils/math/include/vector3.hh"
#include "utils/message/include/message_handler.hh"
#include "utils/named_item/include/named_item.hh"
#include "../include/lvlh_frame.hh"
#include "../include/lvlh_frame_messages.hh"
```

Namespaces

- [jeod](#)

Namespace jeod.

8.1.1 Detailed Description

Define methods for the LVLH reference frame class.

Definition in file [lvlh_frame.cc](#).

8.2 `lvlh_frame.hh` File Reference

Define the class `LvlhFrame`, the class used to represent a local-vertical, local-horizontal reference frame associated with a subject `DynBody`.

```
#include <string>
#include "dynamics/dyn_manager/include/class_declarations.hh"
#include "environment/planet/include/class_declarations.hh"
#include "utils/ref_frames/include/ref_frame.hh"
#include "utils/sim_interface/include/jeod_class.hh"
```

Data Structures

- class [jeod::LvlhFrame](#)

The class used to represent an LVLH reference frame associated with a subject DynBody.

Namespaces

- [jeod](#)

Namespace jeod.

8.2.1 Detailed Description

Define the class LvlhFrame, the class used to represent a local-vertical, local-horizontal reference frame associated with a subject DynBody.

Definition in file [lvlh_frame.hh](#).

8.3 lvlh_frame_messages.cc File Reference

Implement the class LvlhFrameMessages.

```
#include "../include/lvlh_frame_messages.hh"
```

Namespaces

- [jeod](#)

Namespace jeod.

Macros

- #define [PATH](#) "utils/lvlh_frame/"

8.3.1 Detailed Description

Implement the class LvlhFrameMessages.

Definition in file [lvlh_frame_messages.cc](#).

8.4 lvlh_frame_messages.hh File Reference

Define the class LvlhFrameMessages, the class that specifies the message IDs used in the LvlhFrame model.

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

Data Structures

- class [jeod::LvlhFrameMessages](#)

The class that specifies the message IDs used in the [LvlhFrame](#) model.

Namespaces

- [jeod](#)

Namespace jeod.

8.4.1 Detailed Description

Define the class LvlhFrameMessages, the class that specifies the message IDs used in the LvlhFrame model.

Definition in file [lvlh_frame_messages.hh](#).

8.5 lvlh_type.hh File Reference

Define the class LvlhType, which identifies the type of LVLH desired to be calculated.

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

Data Structures

- class [jeod::LvlhType](#)

The class used to identify the type of LVLH desired.

Namespaces

- [jeod](#)

Namespace jeod.

8.5.1 Detailed Description

Define the class LvlhType, which identifies the type of LVLH desired to be calculated.

Definition in file [lvlh_type.hh](#).

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