User Manual 4.0 Assemblies in PATRIUS: Presentation

User Manual 4.0 Assemblies in PATRIUS: Presentation

Sommaire

Introduction

Scope

This chapter presents the global architecture of the assembly: its decomposition in parts and the notion of “properties” of those parts. These are only the main principles of the theme. Other chapters are dedicated to the assembly building and use with code samples.

Javadoc

The main vehicle objects are available in the package `fr.cnes.sirius.patrius.assembly`

Library	Javadoc
Patrius	Package fr.cnes.sirius.patrius.assembly

Links

None as of now.

Useful Documents

None as of now.

Package overview

Main principles :

- An assembly is described by its sub parts (and can be made of only one).
- Each of these parts is definied by a name, a frame to know its position and orientation at any time, and a list of properties.
- The first created part is the "main part". Its associated frame defines the "main frame" of the vehicle.
- The assembly contains only information : it does not act as physical models (force computations for the spacecraft,...) and implements no complex algorithm. "Models" objects are used for this purpose.
- The assembly's creation is made through a "builder" object.

Classes of the package :

- The builder allows the user to instantiate their own assembly, building it step by step (see "Building the assembly").
- The assembly contains several parts , of the IPart type : one "MainPart" and some "Part" objects.
- The parts contain "properties" of the "IPartProperty" type.
- Each PartProperty is associated to a "PropertyType" that allows the user to add only one property of a certain type to a particular part.

Features Description

The tree of parts

Each Part is associated to a frame, which is defined relatively (position and orientation) to the frame of the parent part. The “main part” is associated to the main frame, that has no parent unless the vehicle is linked to the main tree of frames.

Part Properies

Each part has a list of properties that can be chosen arbitrarily amongst the ones available (e.g. mass, geometry, drag coefficient). The design of the Assembly package allows easy additions of new properties.
To ensure that a property of a particular type is added only once, a "Property type" list exists : different properties can be of a same "type" (for examples two ways of describing the drag coefficients).

Models

The physical models (such as forces computations on a spacecraft) are not part of the assembly package.
An assembly does not contain complex algorithm, it is only a description. A model shall be coded in a dedicated class, using if necessary an assembly to get its features.
This way, it is easy to create models implementing existing interfaces, or to create new models and interfaces

Available models

Here is a summary of available models, what they stand for, and the properties needed on the assembly parts for the model to work :

Model	Ability	Properties
AeroModel	Acceleration due to atmospheric drag	At least one part with MASS, AERO_FACET or AERO_SPHERE
DirectRadiativeModel	Acceleration due to radiation pressure	At least one part with RADIATIVE, MASS and either RADIATIVE_FACET or RADIATIVE_SPHERE
InertiaComputedModel	Inertia model for the assembly	INERTIA (note : INERTIA property provides its own mass)
InertiaSimpleModel	Inertia model provided by user	No assembly required
MassModel	Mass of the assembly	MASS (not required : if no part has a MASS property, total mass will be zero, and valid)
RediffusedRadiativeModel	Acceleration due to rediffused radiation	At least one part with MASS and either RADIATIVE_FACET or RADIATIVE_SPHERE, and also with RADIATIVE if albedo is enabled in the model, or RADIATIVEIR if infrared is enabled in the model
RFLinkBudgetModel	Accounting of all of the gains and losses from the transmitter (the satellite), through the medium, to the receiver (the ground station)	RF for the part identified as the antenna
SensorModel	Geometric properties of a given sensor (target visibility, masking, inhibition...)	SENSOR for the part identified as a sensor, GEOMETRY for the masking parts

For a model to work, it needs an assembly providing parts with the right properties. This is done by building a suitable assembly, as described in the [SPC_VBU_Home "Building and using an assembly"] chapter.

Menu de navigation

Outils personnels

- 18.119.127.13
- Discussion avec cette adresse IP
- Créer un compte
- Se connecter

Espaces de noms

- Page
- Discussion

Variantes

Affichages

- Lire
- Voir le texte source
- Historique
- Exporter en PDF

Plus

Rechercher

Rechercher Lire

PATRIUS

- Welcome

Evolutions

- Main differences between V4.15 and V4.14
- Main differences between V4.14 and V4.13
- Main differences between V4.13 and V4.12
- Main differences between V4.12 and V4.11
- Main differences between V4.11 and V4.10
- Main differences between V4.10 and V4.9
- Main differences between V4.9 and V4.8
- Main differences between V4.8 and V4.7
- Main differences between V4.7 and V4.6.1

- Main differences between V4.6.1 and V4.5.1
- Main differences between V4.5.1 and V4.4
- Main differences between V4.4 and V4.3
- Main differences between V4.3 and V4.2
- Main differences between V4.2 and V4.1.1
- Main differences between V4.1.1 and V4.1
- Main differences between V4.1 and V4.0
- Main differences between V4.0 and V3.4.1

User Manual

- User Manual 4.15
- User Manual 4.14
- User Manual 4.13
- User Manual 4.12
- User Manual 4.11
- User Manual 4.10
- User Manual 4.9
- User Manual 4.8
- User Manual 4.7
- User Manual 4.6.1
- User Manual 4.5.1
- User Manual 4.4
- User Manual 4.3
- User Manual 4.2
- User Manual 4.1
- User Manual 4.0
- User Manual 3.4.1
- User Manual 3.3

Tutorials

- Tutorials 4.15
- Tutorials 4.14
- Tutorials 4.13.5
- Tutorials 4.12.1
- Tutorials 4.8.1
- Tutorials 4.5.1
- Tutorials 4.4
- Tutorials 4.1
- Tutorials 4.0

Links

- CNES freeware server

Navigation

- Accueil
- Modifications récentes
- Page au hasard
- Aide

Outils

- Pages liées
- Suivi des pages liées
- Pages spéciales
- Adresse de cette version
- Information sur la page
- Citer cette page

- Dernière modification de cette page le 21 février 2018 à 14:26.

- Politique de confidentialité
- À propos de Wiki
- Avertissements

-