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Introduction

This section describes attitude features of Patrius: attitude laws, slew, guidance, etc.

Applicable and Reference Documents

Applicable Documents

[A1] *CDCF - Fonctions de Base du Patrimoine de Dynamique du Vol*, V1.2, SIRIUS-CF-DV-0049-CN, 2011.

[A2] *Dossier de réutilisation Orekit et Commons Math*, V1.0, SIRIUS-DLR-DV-0080-CN, 2010.

Reference Documents

None applicable.

Overview

The Attitude package of the PATRIUS library has been developed according to the SIRIUS Scope Statement **[A1]**. The themes developed are described hereafter :

Directions

Implementation of directions of space that can evolve in time.

Attitude laws

Several attitude laws are available. These laws were originally designed for orbit determination needs: in order to broaden their applications, a wrapper object has been created to meet the spacecraft attitude field needs.

Attitudes sequence

Implementation of an attitudes sequence for orbit determination: it is possible to define an

attitude law as a series of attitude laws in the context of a propagation.

Attitude legs sequence

Implementation for spacecraft attitude field of an attitude sequence: it is possible to define an attitude leg as a series of attitude legs.

Attitude composition

Implementation of an object that enables to define an attitude law as a composition of several laws.

Orientation

Orientations are similar to attitude providers except that it returns only one angle.

Slew

Implementation of slew. Slews are used in the attitudes sequence to define the transition between two laws. Slews are splits into two functions: slew computations through dedicated classes and slew realization.

Kinematics

Implementation of a tool box for kinematics calculations.

Guidance command

Implementation of the ground and the on-board guidance commands. The first one is computed, the second one is simulated. In both cases, it should be possible to compute the guidance command from a law and to consider the guidance command itself as a law.

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