

User Manual 3.3 Attitude ephemeris

De Wiki

Aller à : [navigation](#), [rechercher](#)

[User Manual 3.3 Attitude ephemeris](#)

Sommaire

- [1 Introduction](#)
 - [1.1 Scope](#)
 - [1.2 Javadoc](#)
 - [1.3 Links](#)
 - [1.4 Useful Documents](#)
 - [1.5 Package Overview](#)
- [2 Features Description](#)
 - [2.1 Generation of attitude ephemeris](#)
 - [2.1.1 Fixed step ephemeris generation](#)
 - [2.1.2 Variable step ephemeris generation](#)
- [3 Getting Started](#)
- [4 Contents](#)
 - [4.1 Classes](#)
- [5 Tutorials](#)
 - [5.1 Tutorial 1](#)
 - [5.2 Tutorial 2](#)
- [6 Tips & Tricks](#)

Introduction

Scope

The purpose is to extend the current Orekit attitude package with classes and methods to compute and process attitude ephemeris.

Javadoc

The ephemeris objects are available in the package `org.orekit.attitudes` in the Orekit addons library.

Library	Javadoc
Orekit addons	Package org.orekit.attitudes

Links

Orekit Attitudes architecture description, [Modèle:SiteLink label="Orekit site" jd="OR" suffix="architecture/attitudes.html"/](#).

Useful Documents

None as of now.

Package Overview

The attitude ephemeris conception is described hereafter :



Legend :

- green : new objects
- grey : modified existing objects
- blue : existing objects

Features Description

Generation of attitude ephemeris

Attitude ephemeris are generated from a sequence of attitude laws using a fixed time step; one or more options can be added when computing ephemeris:

- the **time interval of generation can be smaller** than the attitude laws sequence time interval (but it must be contained in it);
- attitude can be computed when there is a **transition between attitude laws** in the sequence: the user can choose to compute one value (the attitude of the law starting at the transition point), or two values (the attitude of the law starting and that of the law ending at the transition point);
- the **time step can be variable**: in this case, the user must choose a minimum and maximum time step, and a threshold value for the angular distance. The time step is then computed for each ephemeris; the angular distance between two consecutive ephemeris is calculated: when is bigger than the threshold value, the time step is reduced using an iterative algorithm.

Fixed step ephemeris generation

```
final AbsoluteDate date0 = AbsoluteDate.J2000_EPOCH;
final AbsoluteDate dateF = date0.shiftedBy(86400);
final AbsoluteDateInterval interval = new
AbsoluteDateInterval(IntervalEndpointType.OPEN, date0,
dateF, IntervalEndpointType.OPEN);
```

```
AttitudeLegsSequence sequence = new AttitudeLegsSequence(orbit);
double fixedStep = 10;
FixedStepAttitudeEphemerisGenerator generator = new
FixedStepAttitudeEphemerisGenerator(sequence, fixedStep);
final Set<Attitude> ephemeris = generator.generateEphemeris(interval,
FramesFactory.getGCRF());
```

Variable step ephemeris generation

```
final AbsoluteDate date0 = AbsoluteDate.J2000_EPOCH;
```

```

final AbsoluteDate dateF = date0.shiftedBy(86400);
final AbsoluteDateInterval interval = new
AbsoluteDateInterval(IntervalEndpointType.OPEN, date0,
                    dateF, IntervalEndpointType.OPEN);

AttitudeLegsSequence sequence = new AttitudeLegsSequence(orbit);
final double stepMin = 1;
final double stepMax = 10;
final double angMax = 0.15;
VariableStepAttitudeEphemerisGenerator generator = new
VariableStepAttitudeEphemerisGenerator(sequence,
                    stepMin, stepMax, angMax,
AbstractAttitudeEphemerisGenerator.START_TRANSITIONS);
final Set<Attitude> ephemeris = generator.generateEphemeris(interval, frame);

```

Getting Started

[Modèle:SpecialInclusion prefix=\\$theme sub section="GettingStarted"/](#)

Contents

Classes

Class	Summary	Javadoc
AbstractAttitudeEphemerisGenerator	Abstract class containing the methods to generate attitude ephemeris from an attitude laws sequence.	...
FixedStepAttitudeEphemerisGenerator	Class computing attitude ephemeris from an attitude laws sequence, using a fixed time step.	...
VariableStepAttitudeEphemerisGenerator	Class computing attitude ephemeris from an attitude laws sequence, using a variable time step.	...

Tutorials

Tutorial 1

[Modèle:SpecialInclusion prefix=\\$theme sub section="Tuto1"/](#)

Tutorial 2

[Modèle:SpecialInclusion prefix=\\$theme sub section="Tuto2"/](#)

Tips & Tricks

Récupérée de

« http://patrius.cnes.fr/index.php?title=User_Manual_3.3_Attitude_ephemeris&oldid=897 »

Catégorie :

- [User Manual 3.3 Attitude](#)

Menu de navigation

Outils personnels

- [3.15.225.177](#)
- [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

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 26 février 2018 à 16:55.
- [Politique de confidentialité](#)
- [À propos de Wiki](#)
- [Avertissements](#)

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