Tutorials 4.5.1 Orbits

Sommaire

What is an orbit ?

An orbit is defined with a date, a frame then orbital parameters; in the example below, we will use keplerian parameters ...

- semi major axis
- eccentricity
- inclination
- perigee argument
- right ascension of the ascending node
- anomaly (mean, true, eccentric)

Note that it is mandatory to set the "Mu" value (gravitational constant) for both reasons :

1. to be able to convert keplerian parameters to cartesian ones
2. to propagate this orbit using the keplerian motion (considering only the central term) (for more sophisticated propagations (analytical or numerical ones) see specific tutorials).

Code example: create a Keplerian orbit

Orbital parameters

Rather than to set directly orbital parameters when creating an orbit (see previous tutorial), it is possible to go through an intermediate object including these orbital parameters.

Then to create an orbit, we will have to set the date, the frame ... and this object.

Moreover, the advantage of this sublevel is to treat parameters conversions without considering a whole orbit (for example, to convert keplerian parameters in cartesian ones, it is not necessary to use a date or a frame).

Code example: create a Keplerian orbit using parameters

Reentry parameters

In case of atmospheric reentry trajectories, it could be useful to get specific "reentry parameters" defined in an inertial or even rotating frame. The following code gives some examples ...

Code example: Reentry parameters

Orbital parameters conversions

As explained in the previous tutorial, it is possible to make a lot of conversion between different orbital parameters formats. The following code gives some examples ...

Code example: orbital parameters conversions

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