Main differences between V11.3 and V11.4

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Main differences between V11.3 and V11.4

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Compatibility with PATRIUS

This version is compatible with the version 4.4 of the PATRIUS library.

Recurrent date events

Thanks to the V2.1.1 version of GENOPUS, it is now possible to define date (relative or absolute ones) events with a recurrence (for example each day).

New maneuvers trigerring criteriae

Thanks to the V2.1.1 version of GENOPUS, new criteriae on nodes and apsides (as well as recurreent dates) have been added to the previous ones (relative or absolute dates and AOL)

Impulsive maneuvers with orbital parameters criteriae

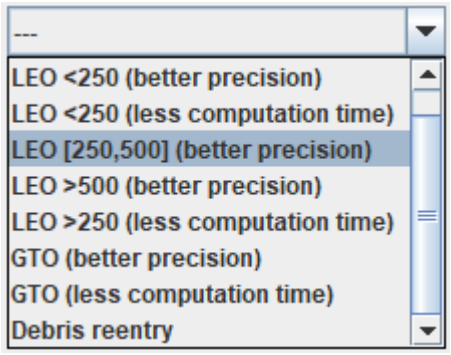
Thanks to the V2.1.1 version of GENOPUS, it is now possible to define an impulsive maneuver giving orbital parameters increments:

- on semi-major axis
- on eccentricity (and semi-major axis eventually)
- on inclination (and semi-major axis eventually)

New data for Dormand Price 853 integrator

Thanks to the V4.4 version of PATRIUS and the V2.1.1 version of GENOPUS with its new specific widget, it is now possible to by-pass the Dormand Price 853 error mode on the minimum step. When this solution is chosen, the propagation will go on even if the conditions on precision will not be temporary fulfilled.

Moreover, a user help is available to initialize tolerances values for different kind of trajectories:



Additional validity criteria on PRS coefficients

Thanks to the V2.1.1 version of GENOPUS, besides validity interval of [0,1] for each coefficient, there is an additional test on the sum of the three coefficients (absorption, specular and diffuse) that must be equal to 1.

Altitudes on stop criteria

It is now possible to choose if the stop criteria will be a geocentric or geodetic altitude.

Best management of consistency between force model and vehicle panels

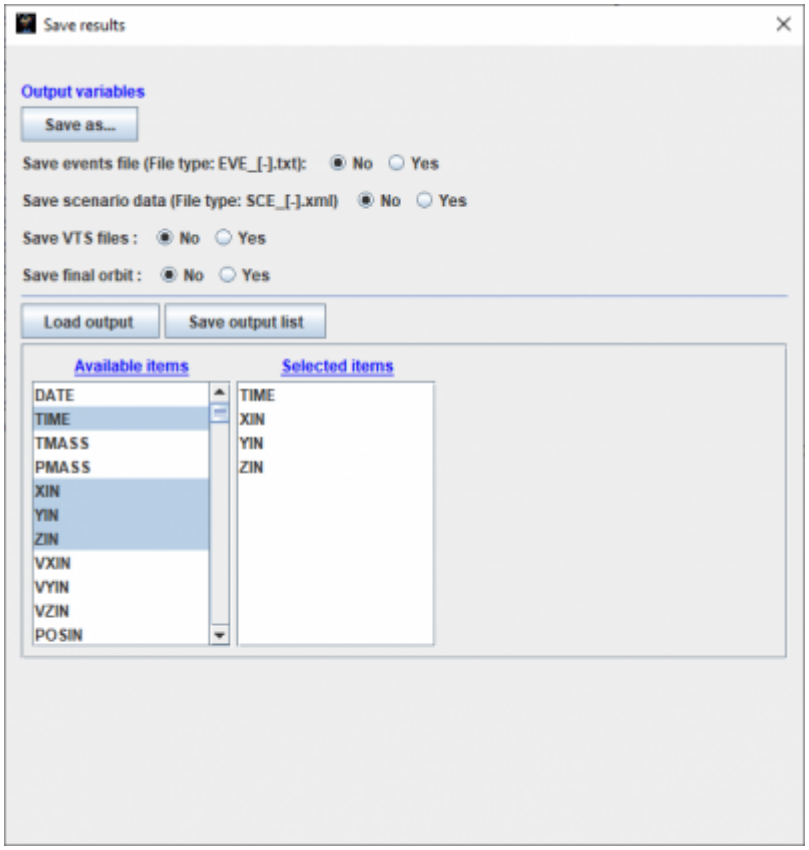
In the previous versions, if we decided to select an atmospheric model without entering data on mass and aerodynamic coefficients, the error was only detected when launching the propagation. Now it is detected sooner and the vehicle tab becomes red as it shifts in error mode.

By default attitude law

Now an attitude law is defined by default (TNW) to avoid to select if it is not critical.

Ergonomics change for output variables selection

Thanks to the V2.1.1 version of GENOPUS, we use a GListSelect widget rather than the previous list.



Using it, it is easier to add / move / remove the variables we want to store in the MADONA columns format file

New possibilities for plotting

Thanks to the V1.9.1 version of GENIUS,it is possible to plot dashed curves. Moreover a new utility tool is available outside **PSIMU** allowing to plot curves from different files (with possibility of relative information): see here or getting it with the full GENIUS package.

New output variables

New variables are now available:

- **F107** (solar Flux / 0 if the atmospheric model does not use it)
- **AP** (geomagnetic index / 0 if the atmospheric model does not use it)
- **DV** (cumulated velocity increment in m/s / 0 if no maneuvers)

Moreover, the time scale used for dates may be selected in the Output panel (UTC by default)

Possibility to customize its own output variables

PSIMU allows to get hundreds of output variables but, for some users, this output list may be incomplete and they will have to wait for a new version to get them. Indeed, these variables could be so particular that there will be no interest to integrate them in a standard **PSIMU** version! A specific mechanism (see here) is now proposed using the Java interface (so, not available with the GUI mode)

to add as many variables as wished. Of course, these variables will be found in the same list as the initial basic variables.

New output modes

Previously, using Java interface, only three output modes were available:

- StorageType.**MEMORY** ⇒ spacecraft states memory stored
- StorageType.**FILE_SC_BINARY** ⇒ spacecraft states directly stored in a SQLite format file
- StorageType.**FILE_COLUMNS** ⇒ output variables stored in a SQLite format file

Now, it is possible to combine any kind of output modes as explained here.

Some new util methods

New methods have been declared as "public" to read data from files (see here).

Anomaly corrections

- Corrections due to GENOPUS anomalies
  - Impossibility to initialize an orbit using a H0-n frame.
  - Calling GPVisibilityFromStationDetector or GPAttitudeSequence widgets make the tool incompatible with a headless mode (no display).
- **PSIMU** is now able to propagate a trajectory using initial orbital parameters correspond to an hyperbolic trajectory.
- when propagation duration is exactly equals to zero, **PSIMU** will no more exit in error.
- use of mean zonal terms was previously wrong in case of *Droziner* or *Cunningham* equations (not available in GUI mode); it is now corrected.
- In Java mode, using **FILE_SC_BINARY** output option, calling getSpacecraftStateList() or getSpacecraftState(i) methods now gives the same kind of results (sort problem corrected).
- geocentric altitude and latitude (so in ITRF frame) are now correctly computed.

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