

# Main differences between V4.10 and V4.9

De Wiki

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**PATRIUS** V4.10 is a major release adding some new features and correcting some bugs. **PATRIUS** is now a single-module project.

## New functionalities

- Ionospheric and tropospheric correction models can now describe derivable parameters
- New class PVEphemeris describing tabulated ephemerides
- PVCoordinatesProvider is now serializable
- New class AberrationCorrection for taking into account the light-time aberration correction, the stellar one (new class StellarAberration), both of them or none of them
- New class DatePolynomialChebyshevFunction representing a Chebyshev polynomial function of date
- The PyramidalField class can now determine whether a field of view is convex and return a complementary field of view, an intersection of a union of fields of view
- AbstractCelestialBody, UserCelestialBody and JPLCelestialBody can be built by means of an AbstractAttractionModel (instead of a simple GM)
- A TopocentricFrame can now be created by defining the origin of the frame with a Vector3D and its zenith
- New class CelestialBodyFrame representing a frame centered on a central body
- New interfaces CelestialBodyEphemeris and CelestialBodyEphemerisLoader to decouple the ephemeris part from the attached body one

## Bugs fixes

- The methods of the class Line take now correctly into account the concept of minimum abscissa
- VisibilityFromStationDetector take now correctly into account the masking by celestial bodies
- ExtremaElevationDetector take now correctly into account the signal propagation
- StationToSatMutualVisibilityDetector and SatToSatMutualVisibilityDetector take now correctly into account the direction of the signal propagation

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