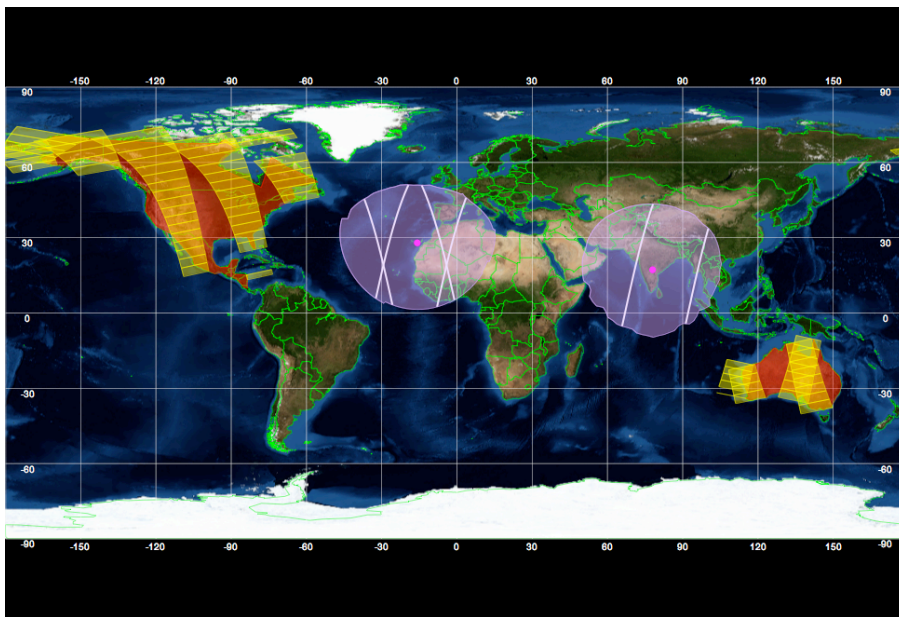


The ESA Earth Observation Mission Software

The Earth Observation Mission Software (EOCFI SW) is a set of multiplatform software libraries which are made available free of charge to any user involved in supporting the Earth Observation missions preparation and exploitation. The EOCFI SW is typically used in Ground Segment operational facilities and in tools developed by ESA and their partners for Earth Observation Missions.

This software is widely used in completed missions (Envisat, GOCE), in missions already or soon in the operational phase (e.g. SMOS, Aeolus, Cryosat, Swarm, Sentinel-1, Sentinel-2, Sentinel-3), in on-going approved missions (e.g. Sentinels, EarthCARE, SeoSAT) and planned to be used in future missions (e.g. MetOp-SG, Sentinel-5P, Jason-CS).



*The Earth Observation Swath and Orbit Visualisation tool (ESOV)
uses the EOCFI SW as internal engine*

The EOCFI SW libraries provide functionalities for a wide range of high-level computations:

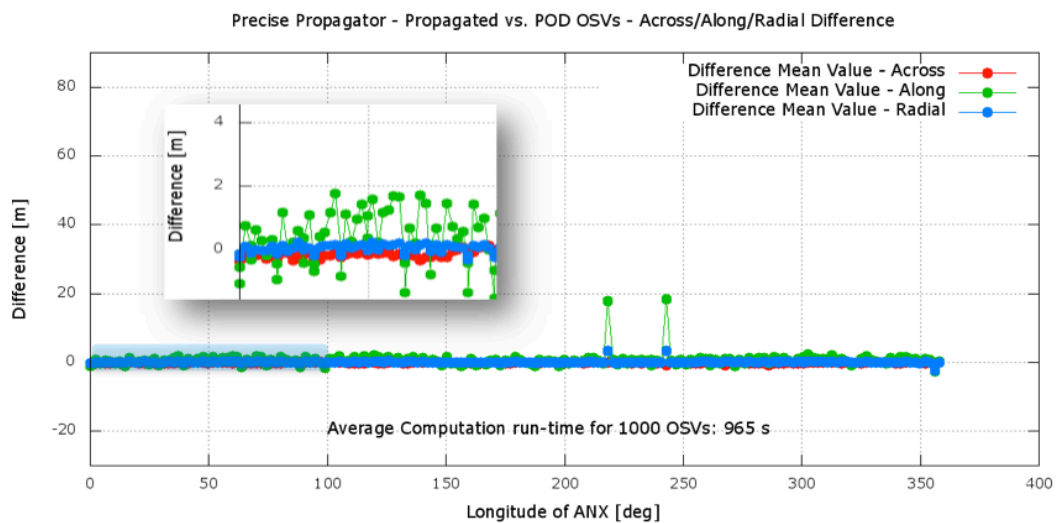
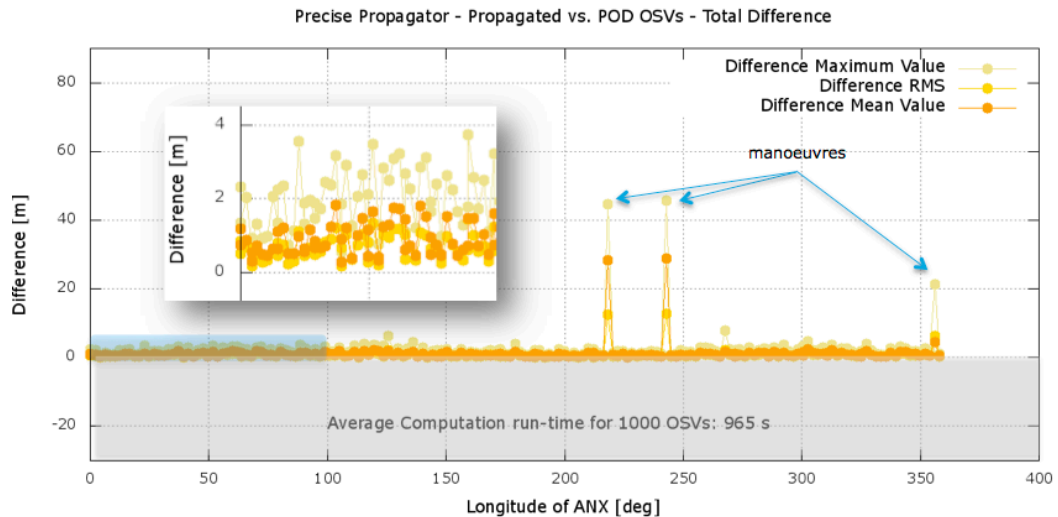
- orbit (e.g. interpolation, propagation using different models);
- attitude (e.g. interpolation, attitude law);
- target pointing (e.g. direct/inverse geo-location with DEM);
- geometric properties of calculated targets;
- instrument swath computation and zone intersection;
- zone/station visibility events;
- observation opportunities for instruments (time segments and coverage).

Low level functions are also provided, for example to support for several file formats read/write; co-ordinates / time transformations.

Thanks to its modular design, the EOCFI SW can be used for the development of facilities and tools belonging to different domains, like mission analysis, mission planning, instrument data processors, instrument performance simulators and ad-hoc tools like test

data generators. The EOCFI SW is written in C (C++ and Java APIs are also available) and is available for several platforms, such as Linux, Microsoft Windows, Mac OSX.

The Software is actively maintained by ESA and a support team is available at ESA/ESTEC to help users in using the libraries; two releases per year are provided in order to resolve problems, to improve or extend already existing functionalities, the quality of the development and deployment process, the runtime performance, and to adapt it to the needs from new missions.



The output of the numeric propagator has been compared to Precise Orbit Determination Data

Before being released, the Software goes through a formal validation process that includes the automated execution of the acceptance tests, on all platforms and for all APIs. The software engineering validation process, as well as other steps of the development, is aided by tools implementing a so-called continuous integration process that ensures overall software quality and allows quick deployment of urgent releases if needed. The scientific validation performed on the EOCFI SW includes accuracy assessment, comparison with real data and to the output of other status-of-the-art Software tools or libraries.

More information related to the EOCFI SW can be found at:

<http://eop-cfi.esa.int/index.php/mission-cfi-software/eocfi-software>