Bachelor Thesis

Evaluation and implementation of different ocean tides models within an orbital propagator

YOUR MISSION:

The OKAPI:Orbits' cloud based backend to propagate orbital motion relies on the orbital propagator NEPTUNE (NPI Ephemeris Propagation Tool with Uncertainty Extrapolation) for highly accurate orbit extrapolation. NEPTUNE has been developed to be used in the Space Situational Awareness context. It is used for orbit determination, re-entry prediction and conjunction analysis services. Currently, NEPTUNE regards the following perturbations for its state vector and co-variance extrapolation:

- gravitational potential models: EIGEN-GL04C, EGM2008 or EGM96,
- atmospheric drag based on NRLMSISE-00 model, or simple power law,
- 3rd body (Sun & Moon), solar radiation, Earth albedo, and solid Earth tides models.

In some cases, even the ocean tides have a measurable impact on a satellites trajectory and thus have to be regarded in order to improve the fidelity of the orbit propagator. Within this thesis the following work should be performed:

- Review available ocean tide models, which have been released (e.g. by IERS)
- An implementation of the approach within NEPTUNE (Fortran-2008).
- Validation of the work based on known objects in space.

YOUR PROFILE:

- Study of engineering, Aerospace engineering or anything related,
- Basic knowledge of orbital mechanics and spaceflight in general,
- Some programming experiences

YOUR BENEFITS:

- Team of motivated entrepreneurial colleagues and experts in the space domain
- Fair payment
- Free coffee, lunch routines and fun office events

ABOUT US:

OKAPI:Orbits is a young start-up developing an innovative AI-based platform for automated collision avoidance of satellites. We value entrepreneurial-minded, creative people, who are willing to take responsibilities to actively contribute to the development of OKAPI:Orbits and its products.

CONTACT: Christopher Kebschull, career@okapiorbits.space