



Orbit Simulation Toolkit for future laser-link based geodesy missions

Vitali Müller (1), Marina Dehne (1), Benjamin Sheard (1), Christoph Mahrtdt (1), Gerhard Heinzel (1), Guangyu Li (2), and Karsten Danzmann (1)

(1) Max-Planck-Institute for Gravitational Physics and Leibniz University Hannover (Albert-Einstein-Institute), Hannover, Germany (vitali.mueller@aei.mpg.de), (2) Purple Mountain Observatory, China

Flexible tools for simulation of satellite orbits and flight constellations are essential for a wide field of applications, like mission design analysis and implementation. They are integral parts for feasibility studies, the so-called Phase A studies, but also provide helpful data for development of post-processing methods.

Especially for a future laser-link based satellite geodesy mission, we have developed this software to find the implications of different orbital parameters on signal-to-noise ratio of ranging observables, as well as other relevant mission parameters, like global coverage. To achieve a precise orbit determination (POD) various perturbations like 3rd body accelerations, drag, solar radiation pressure, solid earth and ocean tides have to be considered. We will present the extent of the simulator with an analysis of its accuracy. Additionally preliminary results of simulating different satellite constellations will be discussed.