



E-GRASP/Eratosthenes: a mission proposal for millimetric TRF realization

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The ITRF is currently worked out by independent concatenation of space technique information. GNSS, DORIS, SLR and VLBI data are processed independently by analysis centers before combination centers form mono-technique sets which are then combined together to produce official ITRF solutions.

Actually this approach performs quite well, although systematisms between techniques remain visible in origin or scale parameters of the underlying terrestrial frames, for instance.

Improvement and homogenization of TRF are expected in the future, provided that dedicated multi-technique platforms are used at best. The goal fixed by GGOS to realizing the terrestrial reference system with an accuracy of 1 mm and a long-term stability of 0.1 mm/yr can be next achieved in the E-GRASP/Eratosthenes scenario.

This mission proposed to ESA as response of the 2017 Earth Explorer-9 call was already scientifically well assessed in the 2016 EE9 call. It co-locates all of the fundamental space-based geodetic instruments, GNSS and DORIS receivers, laser retro-reflectors, and a VLBI transmitter on the same satellite platform on a highly eccentric orbit with particular attention paid to the time and space metrology on board.

Different kinds of simulations were performed both for discriminating the best orbital scenario according to many geometric/technical/physical criteria and for assessing the expected performances on the TRF according to GGOS goals.

The presentation will focus on the mission scenario and simulation results.