Geophysical Research Abstracts
Vol. 15, EGU2013-8983, 2013
EGU General Assembly 2013

LARES' contribution to GGOS – Assessment after one year in orbit

Christian Baumann (1), Daniela Thaller (1), Krzysztof Sosnica (1), Adrian Jäggi (1), Rolf Dach (1), and Maria Mareyen (2)

(1) Astronomical Institute, University of Bern, Switzerland (christian.baumann@aiub.unibe.ch), (2) Bundesamt für Kartographie und Geodäsie (BKG), Frankfurt / Main, Germany

LARES (LAser RElativity Satellite) is a new geodetic satellite in Earth's orbit since February 13, 2012. With a diameter of 364mm and a weight of 386.8kg, LARES has the smallest area-to-mass ratio amongst all artificial satellites, i.e. about 2.5 times smaller than the area-to-mass ratio of LAGEOS. LARES' circular orbit at an altitude of 1450 km and inclined by 69.5 degrees, together with a large amount of SLR observations, promises a valuable extension of the standard LAGEOS-Etalon solutions computed within the ILRS.

Already more than one year of LARES tracking data are available, enabling a first comprehensive assessment of LARES' contribution in the subsequent fields: Concerning the Earth rotation parameters, the impact of the lower altitude and differently inclined orbit of LARES compared to LAGEOS is investigated. LARES is much more sensitive to the variations in the gravity field due to its lower altitude compared to the LAGEOS satellites. The low-degree spherical harmonics of the Earth's gravity field up to degree 4 are therefore studied. The impact of LARES on the terrestrial reference frame is analyzed by looking at the geocenter variation, the station coordinates' stability and the scale.

The contribution of LARES to SLR-derived products is done by comparing the standard LAGEOS-Etalon solutions with the combined LARES-LAGEOS-Etalon solutions. Station-specific range biases are setup for the observations to LARES and estimated over the whole timespan. With the investigation at hand evidence can be given, if the inclusion of LARES into the standard ILRS solution is preferable and satisfies the objectives of the Global Geodetic Observing System for improved space-geodetic products.