Geophysical Research Abstracts, Vol. 9, 07027, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-07027

Satellite Laser Ranging biases and Terrestrial Reference Frame scale factor.

D. Coulot (1), Ph. Berio (2), D. Féraudy (2), O. Laurain (2) and P. Exertier (2)

(1) Institut Géographique National, France (David.Coulot@ign.fr / Phone: +33 01 64 15 32 63)

(2) Observatoire de la Côte d'Azur, France

The Satellite Laser Ranging (SLR) technique plays an important role in the International Terrestrial Reference Frame (ITRF) computation. Indeed, until the last ITRF realization (ITRF2005), this space-geodetic technique provided the origin (geocenter) and the scale factor (with the VLBI technique) of this reference frame. Due to the piecewise behaviour of the scale factor time series computed from the International Laser Ranging Service (ILRS) official combined solution, SLR just provided the origin of ITRF2005: the scale was only provided by VLBI.

As SLR produces the most accurate estimations of the fundamental gravitational constant GM, it should produce a stable scale factor. Although SLR is not as much limited by atmospheric propagation as GPS, DORIS and VLBI are, its range biases can induce inaccuracies on the station vertical component time series and, consequently, on TRF scale factor.

In this paper, we demonstrate that SLR biases must be estimated during any data processing. We also present a rigorous method to compute these biases. Finally, we show that computing range biases really improves the SLR TRF scale factor estimations.