Evolution of the SLR ground and space segments and its potential for GGOS

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SLR is the unique technique that allows determining the geocenter with very high accuracy and contributes to the realization of the scale of a conventional terrestrial reference frame. In addition, due to the high sensitivity of SLR-tracked satellites to the Earth's gravitational field and their mostly simple spherical shape, SLR enables the determination of low-degree spherical harmonic coefficients of the Earth's gravitational field model with high accuracy.

In the near future, the SLR network geometry will undergo significant improvements due to the construction of additional SLR stations, such as Brasilia (established in 2014), Argentina (La Plata, operational soon), India (Mount Abu and Ponmudi, planned for 2017), or Spitsbergen (Ny Ålesund, planned for 2019). Furthermore, the SLR space segment will undergo changes due to the launch of additional satellites, e.g. BLITS-II (already planned).

Within the present study, the impact of an enhancement of the current SLR ground and space segments on the estimation of consistent orbit parameters, station coordinates, EOP, and low-degree spherical harmonics of the Earth's gravitational field model is investigated. The results are evaluated in terms of the potential of SLR to support the ambitious goals of GGOS. In particular, the study will answer the question to what extent additional stations and/or additional satellites will improve current estimates.