1.10 SLR in the framework of the EGSIEM project

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The European Gravity Service for the Improved Emergency Management(EGSIEM) is a Horizon2020 project. Within its framework, monthly gravity field solutions from the Gravity Recovery and Climate Experiment (GRACE) mission shall be derived at different centers. These solutions will be compared and combined. The resulting combined gravity field product will provide complementary information to traditional products for flood and drought monitoring and forecasting. Satellite Laser Ranging (SLR) plays a role in this project for several reasons. The first aspect involves the validation of GNSS orbits, which are computed at the Astronomical Institute of the University of Bern (AIUB), using SLR data. To ensure a consistent set of GNSS orbits, a reprocessing campaign was initiated. The reprocessed products are based on the new Empirical CODE Orbit Model (ECOM), which is used for all orbit products generated at the Center for Orbit Determination in Europe (CODE) from January 4, 2015 onwards. An in-depth validation of these orbits is crucial since the kinematic orbits of GRACE will be based on them. The second aspect concerns gravity field modeling. Since the very low-degree gravity field coefficients derived from GRACE data are degraded by aliasing, SLR to geodetic satellites will be used as well. For the combination of GRACE and SLR data at the normal equation level, a consistent processing in terms of background models and processing standards is essential. The third aspect is based on the fact that the gravity field product delivered by the EGSIEM consortium will include GRACE and SLR data. It is thus desirable to establish a reference frame based on both GNSS data and SLR observations. For this purpose it is planned to analyze SLR measurements to GNSS satellites equipped with a retroreflector array and to estimate common parameters such as station coordinates and geocenter coordinates from a combined set of SLR and GNSS data. The presentation will give an overview of all SLR aspects involved in the EGSIEM project. First results that are available so far are presented as well.