GEOSAT: Combining VLBI, SLR, GPS, and DORIS at the observation level

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GEOSAT is a multi-technique geodetic software that has been under development for about 30 years [P. H. Andersen, "Multilevel arc combination with stochastic parameters". Journal of Geodesy 01/2000; 74(7): 531 - 551]. The last couple of years the development efforts have been headed by a team at the Norwegian Mapping Authority.

The GEOSAT software can be used in the analysis of space geodetic data by combining data from VLBI, SLR, GPS and DORIS at the observation level epoch by epoch. As a result technique dependent systematic errors will be visible as anomalous a posteriori residuals, and can be compensated for by introducing technique dependent empirical models. GEOSAT is based on factorized Kalman filters which allow the estimation of stochastic parameters common for several techniques.

GEOSAT contributed to the IVS solution used in the upcoming ITRF. In addition to VLBI analysis the software can process SLR and GPS data, while DORIS based analysis is under development. Experiments in combining data from different techniques according to the GEOSAT philosophy are currently being done. This presentation will be a description of how GEOSAT combines data from the different techniques, while at the same time reporting the current state of the project and our plans going forward.