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Combination of geodetic observations and geophysical models for estimating consistent Earth rotation and gravity field parameters, individual excitation mechanisms and physical Earth parameters

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Global dynamic processes in the Earth system lead to changes in the Earth's rotation, its gravity field and geometry. These quantities can be monitored by different highly precise geodetic, geometric and gravimetric observation techniques. A joint project within the German Research Unit on Earth Rotation and Global Dynamic Processes aims at the combined analysis and validation of Earth rotation observations and models. Within the project consistent time series for Earth rotation parameters and 2nd degree gravity field coefficients are determined with a Gauss-Helmert-Model. Furthermore individual Earth rotation excitation mechanisms are estimated due to combination of geometric, gravimetric and altimetric space observations and physical models of the atmosphere. Via an inverse model approach fundamental physical Earth parameters are determined from the improved geodetic observation time series and the separated excitations. This project contributes to the field of Earth system science in general and corresponds with the goals of the Global Geodetic Observing System (GGOS). In our poster we summarize the project goals and provide a discussion of recent results.