

## Statistical Evaluation of Very Large Adjustment Models by Monte Carlo Simulations

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### Poster

The GOCE mission, as one of the dedicated gravity field missions, is based on a sensor concept: satellite-to-satellite tracking (SST), and satellite gravity gradiometry (SGG). These SGG and SST observations are used to estimate the parameters of the earth's gravity field in terms of harmonic coefficients up to degree and order 240 which results in about 60000 unknown parameters by means of a least squares adjustment. Tailored solution strategies are necessary to overcome this huge numerical effort. For this reason we avoid to assemble the normal equations and construct an iterative solver, which works directly with the observation equations. This strategy is based on very flexible preconditioned conjugate gradient algorithm (pcgma), which is especially adapted to work with different types of observations. But not only the efficient solution is necessary to assess adjustment models. In addition, the accuracy of the estimated parameters in terms of variance/covariance information and also the relative weighting factors between different groups of observations are of interest. This poster explores Monte Carlo strategies for an efficient and stable computation and propagation of covariance information for huge data sets. It is designed for iterative solution strategies and especially tailored for the pcgma, which is used as solution strategy. The second Monte Carlo technique deals with an efficient way to implement the variance component estimation, which means, to estimate the optimal relative weight factors of different types of observations.