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Characteristics and Performance of GOCE based Gravity Field Models

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A number of global gravity field models based on GOCE data have been produced by ESA's High Level Processing Facility (HPF) and by a few other teams. The models mainly differ by the amount of GOCE data used and by the a-priori information applied. ESA released two model series. One is purely based on GOCE data showing the value of GOCE gravity gradients for global gravity field determination, while the other one in addition makes use of GRACE information in order to further improve the long wavelengths. Other teams aim in the optimal combination of satellite and/or terrestrial data with GOCE gravity gradients in order to determine multi purpose global models.
The paper gives an overview about the characteristics of the various models available until today and specifically investigates their performance by analysis of the estimated errors and by comparison with independent data. Depending on possible applications, recommendations to users of GOCE based global gravity field models will be derived from this analysis.