



Fully automatic along-track pre-processing of the GOCE gravity gradients in the gradiometer reference frame

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We present multiple fully automatic pre-processing of the GOCE gravity gradients (GGs) in the gradiometer reference frame (GRF). For these purposes, we evaluate residuals between the GOCE GGs in GRF (EGG_NOM_2 product) and GGs generated from the SH-based model GO_CONS_GCF_2_TIM_R5 model up to d/o 280. These residuals represent time series which are affected by unforeseen trends. Moreover, in the all-time series, we can see large biases of different components as well as several 'jumps' and outliers, some of them small, but some of them reaching large values. The visual detection of 'jumps' and outliers can be very time-consuming, therefore we have developed automatic strategies to locate and process these anomalies. The first part of pre-processing strategies is dedicated to 'jump' detection. The second part of strategies presents an approach to remove the before mentioned trends from processed time series. Both of these approaches are based on solving the linear and nonlinear diffusion equations applied to one-dimensional time series. Finally, we present the pre-processed GOCE GGs for different time periods.