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Presenting of Earth's gravity field with optimized models of point masses

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The task of the report is to present the most important results obtained by calculation of an Earth's gravity field model by using optimized point masses. The used gravity acceleration data solves the inverse problem by seeking field sources in Earth's core, mantle and crust. The main idea involved in the report is through gravimetrically equivalent distribution of optimized point masses to build a stable Earth's density model and by calculation of its potential to determinate the surfaces of Earth's geoid, core and other geospheres. The proposed approach for solving the problem gives the possibility for complete exhaustion of Earth's internal structure information contained in the used gravimetrical data sample. The method is tested on $5^\circ \times 5^\circ$ grid data of absolute gravity acceleration values which includes 2592 data points. The geoid heights and absolute values for g used in the model are taken from the GRACE Gravity Model 02 (GGM02C) released October 29, 2004 and published to the public on http://www.csr.utexas.edu/grace/gravity/. As a base the mean-tide system model calculated to degree 360 is taken. A number of more and more involved geoid models are constructed by founding of unique and sustainable solutions for gradually increased number of point masses. Comparing the geoids with the base model indicates that with increasing the complexity of the point models, the differences gradually lowering. The underlying purpose is to show that the average of the absolute deviations between the base geoid and the point masses geoid become negligible when the secondary model consist of several hundred point masses.