



Determination of high resolution gravity from global models supported by terrain induced gravity

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The global gravitational model EGM08 is complete to spherical harmonic degree and order 2159, and contains additional coefficients extending to degree 2190 and order 2159. This degree and order allows evaluation of the gravitational potential of the Earth and its functionals with the resolution approx. 5 arcmin and provides not only the low-frequency content of the gravitational field, but also the medium-frequency content. The high frequency content of the spectra of the gravitational field of the Earth is generated namely by the topographic masses. The shape of the topography is nowadays well known and can be used for computing the high frequency content of the gravity field. This contribution deals with the combination of the global gravitational field with the gravity field generated by topography for prediction of three important gravitational quantities: the gravitational potential and its first and second radial derivatives (gravity and gravity gradient) at any point on or above the surface of the Earth. The methodology is based on the modification of the residual terrain correction method. We show the accuracy of our method for all three types of quantities by comparison with observed values in Czech Republic and discuss the error sources, namely the commission error of the global model and the neglecting of the lateral density variations inside the topography.