



Experiments on gravity gradient determination based on the analytical continuation method

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The method of analytical continuation of gravity disturbances (or gravity anomalies) is frequently used in local geoid (or quasigeoid) determination. Our aim is to show a practical applicability of the method by means of numerical experiments based on detailed surface gravity and terrain data in the Czech Republic region. For upward and downward analytical continuation of gravity disturbances we, therefore, introduce an efficient numerical method that can be applied on regular data grids. The advantage of the method is visible, especially when dealing with terrain data of very high spatial resolution. The method has been tested with the use of the Czech terrain model ZABAGED (10 m spatial resolution) and SRTM3 terrain data. To demonstrate the method experimentally, several localities with various terrain characteristics have been chosen. As a byproduct of the experiments we determined vertical gravity gradients at the ground level and compare the results with observed values. Impact of the proposed method on the quasigeoid determination, convergence and overall applicability of the method is discussed. Further discussion concerning a comparison with GOCE data will be added too.