



Towards sub-centimeter geoid: Investigation of modeling requirements

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This study is driven by the fact that global gravity field data is constantly improving and the high level of data accuracy should not be degraded by approximations and linearization errors. Our investigations are focused on the impact of different assumptions within the remove-compute-restore procedure to consider the question whether the effects are significant or negligible for sub-centimeter geoid precision.

In particular some of these effects are:

- 1) Atmospheric reduction of gravity data
- 2) Linearization error in Stoke's formula
- 3) Using full gravity vector instead of radial derivation
- 4) Impact of far zones concerning topographic reduction
- 5) Effects of height differences between the station height and the digital terrain model
- 6) Influence of the digital terrain model resolution to the geoid determination

High precision geoid determination is a very challenging task. Several of the effects mentioned above will provide a substantial contribution to an improved geoid and some will contribute less. An overview of the achieved results is given in the presentation.