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## Processing steps for the compiling AAGRG gravity maps

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First unified complete Bouguer anomaly map of AlpArray area compiled from terrestrial gravity data is in preparation. The following steps to calculate the first version of the map were performed: 1. unification of different spatial, height and gravity systems, 2. getting available detailed (mainly LiDAR-based) elevation models and their transformation from physical to ellipsoidal heights, 3. calculation of mass corrections (gravity effect of the topography between the surface and ellipsoid level) with density  $2\,670\text{ kg/m}^3$ , 4. calculation of bathymetric corrections for water masses below the ellipsoid (correction density  $-1\,640\text{ kg/m}^3$ ), 5. calculation of lake correction for great alpine lakes (correction density  $-1\,670\text{ kg/m}^3$ ), 6. calculation of the final complete Bouguer anomalies based on normal field (Somigliana formula with GRS80 parameters, free-air correction using Taylor series expansion to the 2<sup>nd</sup> order) and particular corrections including also the atmospheric correction.

The quality control of input data was performed based on the height differences between the point data and particular elevation models. Several thousand points with height residuals higher than chosen threshold ( $\pm 50\text{ m}$ ) were excluded. The available detailed local elevation models (resolution 10 – 20 m) were compared with global model MERIT (resolution 25 m).

The most significant methodological innovation is the ellipsoidal heights concept using straightforward calculation of mass/bathymetric corrections in respect to the ellipsoid instead of using the geophysical indirect effect computation. Our specially developed program Toposk was used for mass/bathymetric correction calculation (the standard distance of 166.7 km was used for the first version of the map) as well as for the calculation of lake corrections. Mass corrections amount to hundreds of mGal, while the lake corrections reach more than 5 mGal locally. Atmospheric effect taking into account topography was also calculated and compared with standard atmospheric correction.

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