



## **Possibilities of the regional gravity field recovery from first-, second- and third-order radial derivatives of the disturbing gravitational potential measured on moving platforms**

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Recently realized gravity-dedicated satellite missions allow for measuring values of scalar, vectorial (Gravity Recovery And Climate Experiment – GRACE) and second-order tensorial (Gravity field and steady-state Ocean Circulation Explorer – GOCE) parameters of the Earth's gravitational potential. Theoretical aspects related to using moving sensors for measuring elements of the third-order gravitational tensor are currently under investigation, e.g., the gravity field-dedicated satellite mission OPTIMA (OPTical Interferometry for global Mass change detection from space) should measure third-order derivatives of the Earth's gravitational potential. This contribution investigates regional recovery of the disturbing gravitational potential on the Earth's surface from satellite and aerial observations of the first-, second- and third-order radial derivatives of the disturbing gravitational potential. Synthetic measurements along a satellite orbit at the altitude of 250 km and along an aircraft track at the altitude of 10 km are synthesized from the global gravitational model EGM2008 and polluted by the Gaussian noise. The process of downward continuation is stabilized by the Tikhonov regularization. Estimated values of the disturbing gravitational potential are compared with the same quantity synthesized directly from EGM2008.