



On synthesis of satellite-based geopotential coefficients inside topography

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Current gravity-dedicated satellite missions have been providing accurate data that can be inverted into Stokes's coefficients of the geopotential. Strictly speaking, the harmonic series is applicable only outside the Earth's masses that is often violated if the geopotential is synthesized at the geoid. The contribution deals with derivation of harmonic potential coefficients of topographical and atmospheric masses that would allow for derivation of the geopotential coefficients corresponding only to solid and fluid masses inside the geoid. Geopotential coefficients could be then synthesized at the geoid without violating fundamental requirements for application of a harmonic series. Harmonic coefficients of topographical and atmospheric masses are evaluated using harmonic representations of topographical heights and corresponding mass density distributions in manners that are consistent with spatial resolution and accuracy of current spaceborne data.