عنوان مقاله:

On the estimation of a multi-resolution representation of the gravity field based on spherical harmonics and wavelets

محل انتشار:

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خلاصه مقاله:

The gravitational potential of the Earth is usually modeled by means of a series expansion in terms of spherical harmonics. However, the computation of the series coefficients requires preferably homogeneous distributed global data sets. Since one of the most important features of wavelet functions is the ability to localize both in the spatial and in the frequency domain, regional and local structures may be modeled by means of a spherical wavelet expansion. In general, applying wavelet theory a given input data set is decomposed into a certain number of frequency-dependent detail signals, which can be interpreted as the building blocks of a multi-resolution representation. On the other hand, there is no doubt that the low-frequency part of the geopotential can be modeled appropriately by means of spherical harmonics for the low-frequency part and an expansion in spherical wavelets for the remaining medium and high-frequency parts of the gravity field. Furthermore, an appropriate parameter estimation procedure is outlined to solve for the unknown model coefficients.

کلمات کلیدی:

Spherical harmonics; Spherical wavelets; Multi-resolution representation; Bayesian inference