Wavelet Transform and Its Application in the Interpretation of Gravity Data

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In the analysis of non-stationary time series data, the continuous wavelet transform (CWT) is used successfully. It is used much less frequently in the interpretation of gravity and magnetic data. In this paper a simple method of obtaining location and depth determination of gravity field sources is suggested. This method for gravity data uses wavelets based on integer-order horizontal derivatives of the gravity anomaly from a point source. When applying the method, the gravity data is first differentiated by the same degree as the wavelet order. If the wavelet used is based on the first horizontal derivative of the gravity anomaly from a cylinder, then the CWT is applied to the first horizontal derivative of the data. The CWT then becomes a cross-correlation between the wavelet and the data, and gives useful information about the position and depths of sources. The developed wavelet transform method is demonstrated on synthetic data and finally applied on gravity field data obtained from east Coast of India. These results are compared with Euler deconvolution, which correlate well with the result obtained by Euler method.

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