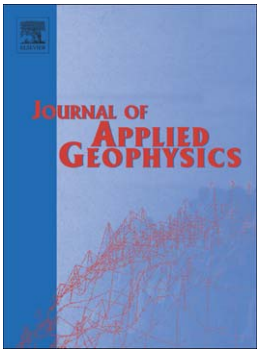

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Edge detection of gravity field using eigenvalue analysis of gravity gradient tensor

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Abstract

In this paper, eigenvalues of the full gravity gradient tensor (GGT) are used to detect edges of geological structure. First, the solving of GGT eigenvalues is discussed; then a new edge detection method is proposed by using the eigenvalues of GGT. Comparing with the pervious edge detection method based on curvature gravity gradient tensor (CGGT), the full gravity gradient tensor contains more independent gradient components that are helpful to detect more subtle structure of the sources. The proposed method is applied to the synthetic data with and without noise to determine the locations of the edges of the mixed positive/negative contract density bodies. It is also been tested on real field data. All of the experimental results have shown that the newly proposed method is effective for edge detection.

Keywords: Gravity field; Edge detection; Gradient tensor; Eigenvalue; Normalization;