

عنوان مقاله:

Automatic estimation of regularization parameter by active constraint balancing method for 3D inversion of gravity data

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خلاصه مقاله:

Gravity data inversion is one of the important steps in the interpretation of practical gravity data. The inversion result can be obtained by minimization of the Tikhonov objective function. The determination of an optimal regularization parameter is highly important in the gravity data inversion. In this work, an attempt was made to use the active constrain balancing (ACB) method to select the best regularization parameter for a 3D inversion of the gravity data using the Lanczos bidiagonalization (LSQR) algorithm. In order to achieve this goal, an algorithm was developed to estimate this parameter. The validity of the proposed algorithm was evaluated by the gravity data acquired from a synthetic model. The results of the synthetic data confirmed the correct performance of the proposed algorithm. The results of the 3D gravity data inversion from this chromite deposit from Cuba showed that the LSQR algorithm could provide an adequate estimate of the density and geometry of sub-surface structures of mineral deposits. A comparison of the inversion results with the geologic information clearly indicated that the proposed algorithm could be used for the 3D gravity data inversion to estimate precisely the density and geometry of ore bodies. All the programs used in this work were provided in the MATLAB software environment.

کلمات کلیدی:

Inverse Problem, Regularization Parameter, Active Constrain Balancing, Gravity Data, Holguin Ore Deposit

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