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Inversion of gravity anomalies of three-dimensional density interfaces using pseudo-BP neural network method

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An inversion scheme to map a three-dimensional (3D) distribution of density interfaces from gravity anomalies is presented. The scheme is base on a combination of the backpropagation (BP) neutral network with the gravity inversion theory. The scheme differs from conventional BP neutral network methods in having no a need of the network training, and the depth of density interfaces in a hidden layer are directly determined, and so call it pseudo-BP neural network mothed. Application of the scheme to synthetic data sets shows that 3D density interfaces can be precisely mapped. The inversion method has been applied to gravity data of the southern Okinawa through and the 3D distribution of both the Tertiary basement and the MOHO interface were determined.

Key words: Three-dimensional gravity inversion, Density interfaces, pseudo-BP neural network, Southern Okinawa trough, Moho, Tertiary basement