3D Gravity Inversion using Tikhonov Regularization

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A b s t r a c t

Subsalt exploration for oil and gas is attractive in regions where 3D seismic depth-migration to recover the geometry of a salt base is difficult. Additional information to reduce the ambiguity in seismic images would be beneficial. Gravity data often serve these purposes in the petroleum industry. In this paper, the authors present an algorithm for a gravity inversion based on Tikhonov regularization and an automatically regularized solution process. They examined the 3D Euler deconvolution to extract the best anomaly source depth as *a priori* information to invert the gravity data and provided a synthetic example. Finally, they applied the gravity inversion to recently obtained gravity data from the Bandar Charak (Hormozgan, Iran) to identify its subsurface density structure. Their model showed the 3D shape of salt dome in this region.

Key words: gravity inversion, base salt, Tikhonov regularization, Euler deconvolution, Bandar Charak.