

3D inversion of gravity data by separation of sources and the method of local corrections: Kolarovo gravity high case study

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Abstract: We present a novel methodology for 3D gravity/magnetic data inversion. It combines two algorithms for preliminary separation of sources and an original approach to 3D inverse problem solution. The first algorithm is designed to separate sources in depth and to remove the shallow ones. It is based on subsequent upward and downward data continuation. For separation in the lateral sense, we approximate the given observed data by the field of several 3D line segments. For potential field data inversion we apply a new method of local corrections. The method is efficient and does not require trial-and-error forward modeling. It allows retrieving unknown 3D geometry of anomalous objects in terms of restricted bodies of arbitrary shape and contact surfaces. For restricted objects, we apply new integral equations of gravity and magnetic inverse problems. All steps of our methodology are demonstrated on the Kolarovo gravity anomaly in the Danube Basin of Slovakia.

Key words: Potential field methods, 3D inversion, Gravity interpretation, Anomalous body

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