

3D subsurface imaging by aeromagnetic data — Optimizing minimum norm analysis under the lack of unique solution

Tadashi Nakatsuka[1]; Shigeo Okuma[1]

[1] GSJ, AIST

<http://staff.aist.go.jp/tad.nktk/>

In dealing with total intensity magnetic anomalies, while the application of potential field theory enables easier understanding, there is a problem of the lack of unique solution for the subsurface structure. There are two directions to overcome this difficulty. One is to acquire data of another sort of observation for mutual constraints, the other is model simplification of describing the complicated real nature. Both are not exclusive, and the latter stands on the idea that complicated nature is understood in terms of simplified model. The minimum norm solution for underdetermined problem is a useful method to accomplish this.

Now we investigate the effective method of 3D imaging from the aeromagnetic anomaly data, with making practical use of the minimum norm property of CG method applied to underdetermined problem of 3D inversion analysis. As principal points, whether the magnetization parameters are selected regardless of their corresponding volumes or not, how to take account of the effect of decreasing amplitude with source distance, etc., will be discussed.