A simple method to calculate RTP (Reduction To the pole) based on the equivalent anomaly method.

Mitsuru Utsugi[1*]

[1]Kyoto Univ.

In this study, we present a new method to calculate the RTP (Reduction To the Pole) of the observed total force anomaly.

RTP takes the anomaly, as measured at any latitude, and transforms it into that which would have been measured if the body had been laid at the magnetic pole i.e. the area where the field inclination is vertical and the anomalies from symmetrical bodies are symmetrical. RTP can be obtained by applying the direction integration and vertical differentiation to the observed magnetic total field distribution, i.e., observed total field can be transformed to RTP by integrating with respect to magnetization direction, geomagnetic field direction and differentiating with respect to the vertical direction. These operations are usually performed in the frequency domain assuming the observation surface is a plain. However, on the mountainous region, aeromagnetic survey is usually done along the terrain with low altitude to obtain high-resolution magnetic field distribution. For such a data, the above frequency domain algorithm can not be applied. Nakatsuka and Okuma (2006) presented a method for the upward continuation based on equivalent sources. Using this method, magnetic total force can be estimated on arbitrary point above the observation surface using observed total field distribution. So, it is expected that we can obtain RTP by directly applying the integration and differentiation to the estimated total field distribution. In this study, we present a simple method to calculate RTP based on the direct integration and differentiation of estimated total field distribution.

Keywords: aeromagnetic survey, reduction to the pole, equivalent anomaly method