

MAGNETIC DATA REDUCTION OF BASEMENT
CORRECTION

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Abstract

Earth magnetic field is composed of three main magnetic components; earth magnetic component, external magnetic component, and the crustal magnetic component. The crustal component is a resultant of two sub components remnant magnetism and induced magnetism. The remnant component formed during the genesis of rocks in the crust and aligned according to earth magnetic field. The induced component is a secondary field that is induced by the present-day earth magnetic field. The strength of the crustal magnetic field is not a constant, varies from location to location, depending on the abundance of magnetic minerals in its formation.

The magnetic properties are widely used in mineral exploration. Many ferro-magnetic ore deposits display a strong magnetic character that enables to screen such formation from the background geology. Magnetic surveys, both air-borne and detailed ground follow up methods are commonly applied in delineating deposits with high magnetic characters.

A magnetic anomaly is a product of the three components at a given location: earth magnetic component, crustal component and the environmental influence. Except the former two components, environmental influence is a time dependent variable which needed to be corrected with an assistance of a base-station magnetometer.

The base correction is conducted with an assumption that the environmental effects over the survey area constant. The base magnetometer is synchronized with the rowing component and the environmental effect is removed according to the respective time stamps. However, if the survey area is large, the base station need to be shift as the assumption is no longer valid. As the crustal magnetic component of locations where the base station(s) establish during a survey is not a constant, a correction needed to be apply for base stations.

The proposed method uses the property of 'continuity of geo spatial data' for derive a constant that can directly add in to the survey data, to avoid the dependency of the location of the base station(s).