



A regional lithospheric magnetic modeling over Antarctic region

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The compiled near-surface and satellite lithospheric magnetic anomaly field data are modeled with a locally-concentrated spherical harmonic presentation technique over the Antarctic region. Studies on geomagnetism have used a spherical harmonic analysis as a tool of representing Earth's magnetic fields both of internal and of external. Therefore, geomagnetic features have been modeled by spherical harmonics in a global scale. However, this global approach is best applied where the data are uniformly distributed over the entire Earth. Satellite observations meet this requirement, but unequally distributed data cannot be easily adopted in global modeling. A spherical cap analysis (Haines, 1985) has been used as an alternative in regional modeling for geopotential fields and recently this technique was well updated by Thebault et al. (2006) and Thebault (2008). In this study, we introduce a more straightforward regional analysis technique as a magnetic field modeling that has been effectively implemented to model satellite gravity field data for small cap regions of the Earth and Moon (Han et al., 2008). We tested to compare between the methods in both global and regional approaches and a case that the errors are propagated outside the region of interest in modeling in a different way. A high-resolution, regional modeling is also attempted with ADMAP data grids by a lesser number of spherical coefficients that are relevant to the region of interest.