

Surficial density estimation from gravity data using Delaunay triangular network

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We have so far developed the method of smoothing of the geomagnetism and gravity data based on a cubic B-spline function. When big variation is in the distribution of data, smoothing by a spline function has the fault that many numbers of nodes of a spline must be used.

We developed the method of smoothing using the Delaunay triangulation of gravity data. First, the Delaunay triangle network is built from distribution of gravity data. The parameter of a solution is the value of each vertex of the Delaunay triangle which is in agreement with measurement. The parameters are calculated to minimize residual, inclination of triangular and difference of the inclination between adjoined triangular. At this time, ABIC determines the value of the hyper-parameter which adjusts trade-off between fitness with data and smoothness of the triangular surface. In order to solve large-scale and sparse simultaneous equations, we applied the ICCG method this time.

We applied the developed method to large-scale gravity data which has big variation of distribution. The result shows that new method is effective in estimation of crust surface density.

