Fractal analysis of gravity anomaly and fault distribution around subjacent source fault in Japan

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Dense seismograph networks, developments of data analysis and inversion theory of strong ground motion provide strong motion records with high degree of precision. Government and municipalities demand estimation of strong ground motion for disaster prevention planning. The estimation of strong ground motion requires to be assumed subjacent source fault with high precision. Active fault information play important role for assuming the source fault. However, recent earthquakes, such as 2000 Tottori earthquake, did not accompany earthquake faults on the surface. These earthquakes were difficult to estimate subjacent source fault from active fault information. Thus, other information also needs to be assumed subjacent source fault of earthquake without surface rupture.

Gravity anomaly, which corresponds to subsurface density distribution, is one of efficient information. However, gravity anomaly consists of density distribution at various depth. Thus, extraction at interesting depth is required. It is difficult that defining suitable filter for detecting fault. There are several methods and parameter for filtering technique of gravity anomaly. Quantitative evaluation between gravity anomaly and fault is another difficult problem.

We applied fractal analysis to evaluate relation between gravity anomaly and fault distribution quantitatively. Fractal dimension analysis provides dimension of complex shapes. Thus we performed fractal dimension analysis to evaluate these relations. We will discus relation among gravity anomaly and active faults around source faults based on fractal analysis.