Fault development history using gravity gradient tensor analysis: A case study for the eastern boundary fault zone of the Shonai plain, northeastern Japan.

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Gravity gradient tensor (ggt) analysis, which is the analytical technique of airborne gravity gradiometer, has been developed by researchers in geophysical exploration over the past decades. On the other hand, subsurface structure analysis using gravity anomalies is generally to estimate density structure, and the arbitrariness of interpretation is the weakest point. However, by applying the ggt analysis to gravity anomalies, various underground structural indicators can be derived, and semi-automatic interpretation becomes possible. In this study, we evaluate the shape and maturity of active faults objectively using indicators such as dimensionality (2D-like ~ 3-D like), the intensity of structural boundary and inclination angle, which were introduced in Kusumoto (2015, 2016). As an example, we applied these methods to the surrounding area of the eastern boundary fault zone of the Shonai plain (EBFSP) and considered the history of fault development. As a result, the EBFSP can be interpreted as tip spray network of the Aosawa fault zone running parallel to the east side of EBFSP. As a result, the EBFSP can be interpreted as a tip splay network of the Aosawa fault zone running parallel to the east side of the EBFSP. References: Kusumoto, 2015, BUTSURI-TANSA, 68, 277-287.; Kusumoto, 2016, BUTSURI-TANSA, 69, 53-63.; Perrin et al., 2016, doi:10.1016/j.crte.2015.05.002.

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