Three dimensional resistivity structure at focal area of 2004 Rumoi-Nanbu earthquake (M 6.1)

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The Rumoi-Nanbu earthquake (M 6.1) occurred at northern Hokkaido, Japan, 14 December, 2006. The focal area of this earthquake situated in the strain concentrated belt derived from relative motion between Amurian Plate and Ohotsk Plate (e.g. Takahashi et al., 1999). Focal mechanism of this earthquake is reverse fault type, and striking north to south direction. To discuss a relationship between structural feature and seismogenic character, we carried out MT survey on three profiles and obtained 2D resistivity images in and around the focal area. All images were roughly comprised of two layers: upper conductive layer, existing surface to 3-5 km in depth, and lower resistive layer. Comparison of the resistivity image with the surface geology and drilling data indicate that the upper conductive layer and the lower resistive layer correspond to Cretaceous-Tertiary sediment rocks and older igneous rocks, situating as its basement, respectively. On the basis of this correspondence, we found a clear upheaval structure in one profile across center of the focal area. This implies existence of steep variation in rigidity around the focal area. The rigidity variation suggests local accumulation of strain concentration which probably triggered the earthquake. The gravity anomaly (Honda et al., 2007) and the anticline structure observed in surface geology indicate that the rigidity varies along strike direction of the fault or the anticline. To clarify above subsurface structure including along strike variation, we constructed three dimensional resistivity structure using 29 sites of magnetotelluric data covering the focal area. The resistivity modeling was used the 3D forward modeling code developed by Fomenko and Mogi (2002). The 3D model enabled us to discuss lower crustal heterogeneity under the focal area.