ネットワークMT観測による濃尾地震断層周辺域広域深部比抵抗構造について

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On the 3-D resistivity structure beneath around the 1891 Noubi Earthquake seismic fault by the Network-MT

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Network-MT survey has started since Jun, 2011 in the western part of Chubu district, central Japan, where one of the largest inland earthquakes in Japan, the 1891 Noubi Earthquake (M8.0), took place. We aims at investigating static shift free fine structure in the vicinity of the fault, by combining the Network-MT and conventional wide-band MT data. Since both the Philippine Sea Plate and the Pacific Plate are subducting beneath the area, and the Niigata-Kobe Tectonic Zone, where most significant strain rate accumulation was detected before the 2011 great Tohoku Earthquake by the dense GPS array (GEONET), we also aimed at obtaining wide and deep resistivity structure beneath whole Chubu district to investigate dehydration process on the subducting plates and generation mechanism of the Niigata-Kobe Tectonic Zone.

In 20 toll areas, we measured potential differences on dipoles of from several to several 10s km lengths with the aid of the metallic telephone lines. Magnetic fields were measured at 2 stations in the target area and at the other 2 stations for the purpose of remote referencing. We first estimated response functions between each potential difference and two horizontal components at a geomagnetic station. Then they were composed to yield sets of impedance tensors. We detected the anomalous phase (greater than 90 degree) in the mode where the E-field and B-field are respectively parallel and perpendicular to the Japan Sea coast, which grows in the period range longer than 10^3 s, at almost all the stations in Fukui Prefecture near the Japan sea coast (in the most back-arc side).

In this presentation, we show the results from 3-D inversion of the impedance tensors by using the wsinv3dmt code (Siripunvaraporn et al., 2005). The phase anomaly was explained by localized and shallow conductive Fukui Plain which faces the Japan Sea. Along the Noubi Earthquake seismic fault zone, a shallow and narrow conductive zone was located, and beneath the zone, a rather resistive layer (higher than 1k Ohm m was distributed. In addition, a deep seated conductive zone was detected along the Fukui-Gifu boundary (and along the Niigata-Kobe Tectonic Zone). The conductive zone indicates existence of dehydration from the Pacific Plate or the Philippine Sea slab, and may cause the strain rate accumulation.