

Resistivity imaging across the source region of the 2004 Mid-Niigata Prefecture earthquake

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Across the source region of the 2004 Mid-Niigata Prefecture earthquake, wideband magnetotelluric (MT) survey was performed in November and December, 2004. In November, owing to the temporal stop of the DC powered railways around the area together with intense geomagnetic activity, we can obtain good MT records up to long periods as long as 10,000s. Two dimensional regional strike was evaluated with the aid of the Goorm-Bailey tensor decomposition together with phase tensor and induction vector analysis. As a result, N15W is determined for the strike. This strike is oblique to the local geological trend and strike of the main shock source fault together with aftershock distribution. This may be due to the existence of thick sedimentary basin to the WSW of the survey area.

Two dimensional resistivity structure was determined with the aid of an ABIC inversion code by Ogawa and Uchida, 1996, where static shift is considered and corrected. Characteristics of the structure are as follows: (1) existence of about 10km thick sedimentary layer on the top, (2) mainshock occurred on the boundary between this conductive sedimentary layer and resistive body beneath it, (3) existence of conductive body from the lower crust to the top of upper mantle beneath the source region. The third conductive body probably indicates existence of fluids in the depth. If this feature is common along the Niigata Kobe Tectonic Zone, this may cause significant concentration of strain rate along the tectonic zone.