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Identification of the source fault of the 2000 western Tottori earthquake (Part I): 3-D resistivity structure

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In this study we have determined three dimensional (3-D) crust and uppermost mantle resistivity structure in and around the aftershock area of the 2000 western Tottori earthquake (Mj 7.3). 37 MT stations were deployed in the study area. The data were collected using five component wide-band MT instruments (Phoenix MTU-5 system). A simultaneous remote reference measurement was carried out at the Sawauchi site (900 km northeast of the study area). The observed apparent resistivity and phase data were inverted simultaneously using the 3-D inversion code of Sasaki [2004].
The obtained 3-D resistivity model through the inversion shows as follows. (1) A prominent conductive anomaly exists in the lower crust and uppermost mantle beneath the southwest of the aftershock area. (2) Hypocenters of the main-shock and low-frequency micro-earthquakes are located near the surface of the conductor. (3) These results indicate that the conductor may represent a fluid-filled, fractured rock matrix that contributed to the rupture nucleation.

Reference
Sasaki, Y. (2004), Three-dimensional inversion of static-shifted magnetotelluric data, Earth Planet. Space, 56, 239-248.

Keywords: 2000 western Tottori earthquake, Magnetotelluric soundings, 3-D resistivity structure, Crust, Uppermost mantle