

# Electromagnetic Imaging around the Nankai Mega-Earthquake Zone, on and off the Kii peninsula, Southwest Japan

# Tada-nori Goto[1]; takafumi kasaya[1]; Kiyoshi Baba[1]; Hitoshi Mikada[1]; Kiyoshi Suyehiro[1]; Toshiki Watanabe[2]; Toshinori Kimura[3]; Yuzuru Ashida[3]; Satoru Yamaguchi[4]; Kiyoshi Fuji-ta[5]; Kazunobu Yamane[6]; Hisashi Utada[7]; Makoto Uyeshima[8]

[1] JAMSTEC; [2] RCSV, Nagoya Univ.; [3] Faculty of Engineering, Kyoto Univ.; [4] Earth and Planetary Sci., Kobe Univ.; [5] Earth and Planetary Sci, Kobe Univ; [6] GERD; [7] ERI, Univ. of Tokyo; [8] Earthq. Res. Inst., Univ. Tokyo

<http://www.jamstec.go.jp/jamstec/DSR/tgoto/index-e.html>

Great earthquakes periodically occurred along the Nankai Trough. In this study, we report results of the extensive electromagnetic surveys on and off the Kii peninsula to image the electrical conductivity structure around the rupture area of the 1944 Tonankai earthquake. Since the conductivity is sensitive to existence of fluid, conductivity structure of the crust can be a good index for fluid distribution.

Off shore, a high-frequency ocean bottom electromagnetic survey revealed a highly conductive oceanic crust on the Philippine Sea plate before its subduction. The conductivity of the oceanic crust, however, decrease at the depth of 5 - 10 km below the sea floor of the island arc crust, where the up-dip limit of the 1944 rupture zone is located. The coincidence of the conductivity variation and the rupture zone suggest that fluid has a key role to control the up-dip limit of the rupture.

Below the Kii peninsula, large-scale conductivity structures obtained by on-land and off-shore long-term electromagnetic surveys and Network-MT surveys show us a highly conductive zone in the mantle wedge, where hypocenters of deep tremors (Obara, 2002) are concentrated. Also, the subducting Philippine Sea plate can be imaged as a low conductivity zone. The conductive mantle wedge with the deep tremors is possibly related to fluid or serpentinized material. In addition, the down-dip limit of the 1944 rupture zone is approximately located on the conductive mantle wedge. It may be suggested that the down-dip limit of the rupture is also controlled by existence of fluid. Further analysis by using whole data set of these experiments can reveal the conductivity structure near the 1944 rupture zone itself and give us useful information to discuss whole process of the great earthquake.