e-AIMS (Electromagnetic Asperity Imaging at Marmara Sea)

Yasuo Ogawa[1]; Takafumi Kasaya[2]; Yoshimori Honkura[3]; Naoto Oshiman[4]; Masaki Matsushima[5]; Shintaro Nagaoka[6]; S. Bulent Tank[7]; M.Kemal Tuncer[8]

[1] TITECH, VFRC; [2] JAMSTEC; [3] Earth and Planetary Sci., Tokyo Institute of Technology; [4] DPRI, Kyoto Univ.; [5] Dept. Earth Planet. Sci., Tokyo Tech; [6] Earth and Planetary Sci., TITECH; [7] Earth and Planetary Sci., Titech; [8] Bogazici Uni. Kandilli Obs. & E.R.I.

The main strand of the North Anatolian fault Zone (NAFZ) is a 1200 km long right–lateral strike–slip fault that extends in the east–west direction, separating the Anatolia block from the Eurasia plate. The events of a series of large earthquakes have been propagating westwards along NAFZ since 1939. The western part of NAFZ breaks into several strands. The rupture of the Izmit earthquake (1999) extended by about 120 km in the east–west and the slip on the fault is limited to a depth of about 20 km in the crust.The crustal and upper mantle resistivity structure of the focal area of the Izmit earthquake was investigated intensively by wide–band and long–period (flux-gate) magnetotelluric measurements (Tank et al., 2003, 2005). The most important features of the resistivity model were that the hypocenter was located at the resistive side of the resistive–conductive boundary and that there was a clear conductor in the upper mantle depth beneath the fault zone.Assuming the conductor as a ductile zone and the resister as a brittle zone, the stress will be accumulated at the resistive–conductive boundary and the resistive block may break as an asperity. This type of model is supported by many Japanese intra-plate earthquakes (e.g. Ogawa et al., 2001) as well as NAFZ.Further migration of the earthquakes along the NAFZ is expected towards Istanbul. The problem is that the fault zone is off-shore. In this study, we aimed at imaging the asperities and segmentation of the fault off-shore. In February to March 2008, we will deploy 5 units of ocean bottom electromagnetic (OBEM) equipments (Kasaya et al., 2006) along a profile which crosses the ANFZ off-shore. We also deploy on–shore MT stations using wide-band and long–period instruments. These new measurements will be the first step towards imaging the asperity of the NAFZ near Istanbul.