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# Resistivity Structure Analysis beneath the Eastern Marmara Sea by 2D OBEM Modeling.

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In this study, we perform Magnetotelluric method (MT hereafter) in the Sea of Marmara which is an inland sea located at north western Turkey as different from previous marine electromagnetic studies performed in open oceans. Turkey is seismically very active country that has hosted large destructive earthquakes throughout the history. Westward migration of big events along the North Anatolian Fault Zone (NAFZ), one of the main fault zones in the region of interest, and occurrence of the last two demonstrative earthquakes (Mw7.4 Izmit and Mw7.2 Duzce, 1999) at the eastern edge of the Sea of Marmara indicate that the next big event is most likely expected to occur at the Sea of Marmara. Previous MT studies clearly show the relation between the seismicity and resistivity variation near fault zones. Such as, generally the big earthquakes occur at asperity zones where high wave velocities and high resistivities are observed and locations of the fault zones widely overlap the resistivity transition zones. In order to reveal the extension of the NAFZ and crustal structure within the Sea of Marmara, Ocean Bottom Electromagnetic (OBEM) data at 16 sites were collected during three campaigns between 2008 and 2009. Site locations were arranged in accordance with 3D and 2D modeling. Chave and Thompson code (1987) was applied in order to obtain transfer functions from continuous electric and magnetic fields (three components). Strike analysis for east two profiles show almost 90 and 70 degree strikes for the long (P1) and short (P2) profiles respectively. These strikes are consistent with possible trace of the NAF around the Cinarcik Basin. Comparison of 3D and 2D forward modeling results demonstrates significant effect of the bathymetry on the data set. However, these effects are almost same in TM case and similar in TE that provides us to trust 2D modeling at least for TM mode. We performed 2D inversion modeling using Ogawa and Uchida (1996) code modified by us to account for the bathymetry effects on the measurements. According to 2D inversion results, there is a high conductivity anomaly located at a depth of upper mantle and bounded with resistive zones at the north and south beneath the eastern Marmara Sea. In this presentation, we show the OBEM data analysis and relation of the results with the structure beneath the Sea of Marmara.

キーワード: Sea of Marmara, North Anatolian Fault Zone (NAFZ), Ocean Bottom Electromagnetic (OBEM), Magnetotelluric, Resistivity
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