

Preliminary results of marine magnetotelluric analysis across the central Mariana transect

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We have carried out a marine magnetotelluric (MT) transect across the central Mariana subduction system using ocean bottom electro-magnetometers (OBEMs), ocean bottom electrometers (OBEs), and ocean bottom magnetometers (OBMs) to provide a comprehensive image of the electrical conductivity structure of the Mariana island-arc system extending from the Pacific ocean to the West Mariana Ridge (remnant arc) through the Marina Trough. The Mariana subduction system is the classic example of an intra-oceanic arc, trench, and back-arc system. Our transect, which includes three upwellings of serpentine diapirs, arc volcanism, and back-arc spreading, will address issues of hydration of the mantle wedge resulting from subduction and the nature and distribution of subsequent melting through estimation of the electrical conductivity structure. We deployed 33 OBEMs, 7 OBMs, and 7 OBEs at 40 sites on KR05-17 cruise in December of 2005 and successfully recovered 28 OBEMs, 7 OBMs, and 6 OBEs at 35 sites on KR06-12 cruise in September of 2006. The full length of the transect is about 700km. Site spacing in the fore-arc and Pacific ocean basin are several tens of kilometers, but in the vicinity of the back-arc spreading center is only a few km. We will show preliminary results of analysis of the newly obtained data in addition to those from previous studies.