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Resistivity Structure beneath Kyushu by the Network-MT Data: Imaging of the Volcanic Formation along the Subduction Zone

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The Kyushu district is a typical high angle subduction zone in Japan, at which the hot Shikoku basin and the cold Philippine sea plate subduct beneath the Eurasian plate, and many quaternary active volcanoes, as the Aso volcano, the Kuju volcano and Kirishima volcano, are located along the volcanic front. And it is important to investigate structure beneath Kyushu for understanding the volcanic formation. In the Kyushu district, the Network-Magnetotelluric (MT) observations, which used telephone line networks of several tens kilometers electrode spacing for the measurement of voltage differences (Uyeshima, 1990), were carried out from 1993 to 1998 to cover the whole island of Kyushu. We reanalyzed these data sets, which have geoelectromagnetic information from the crust to upper mantle, in order to determine regional scale electrical conductivity structure and applied two-dimensional (2D) inversion analyses using the REBOCC inversion code (Siripunvaraporn and Egbert, 1999) to the Network-MT impedance responses. Here we adjusted appropriate the horizontal and vertical smoothing factors according to the intervals of the observation sites along each profile across the characteristic geology, tectonics and volcanoes. And we were able to get a rough grasp of the resistivity structure beneath whole Kyushu. Further, we found that a conductive block exists beneath the volcano of which the bottom extends to the backarc side and the forearc side including the Philippine Sea plate is resistive. Then we also carried out a three-dimensional (3D) inversion analyses to check the 3D effects on the obtained 2D imaging, especially, the ocean effect surrounding the Kyushu district. In this presentation, we would like to explain details on the 2D resistivity structure related to the subducting Philippine Sea plate and the active volcanoes as well as and checking 3D effects on the 2D imaging, and also introduce the future direction of this study.