IMAGING OF THE REGIONAL RESISTIVITY STRUCTURE AROUND A SUBDUCTION ZONE BY USING LONG DIPOLE DATA

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The Kyushu district is a typical high angle subduction zone in Japan, at which the Shikoku basin and the Philippine sea plate subduct beneath the Eurasian plate, and many quaternary active volcanoes, such as Aso, Kirishima and Sakurajima volcanoes, are located along the volcanic front in Kyushu. Network-MT observations, which use telephone line networks as long baseline telluric measurements (Uyeshima, 1990), were carried out in the Kyushu district from 1993 to 1998. We analyzed these data sets to determine regional scale electrical conductivity structure. As a preparatory step for three-dimensional imaging of the electrical resistivity structure beneath the Kyushu district, we applied several two-dimensional inversion analyses to the Network-MT impedance responses across the characteristic geology, tectonics and volcanoes. Here we used the REBOCC inversion code (Siripunvaraporn and Egbert, 1999), which adjusts appropriate the horizontal and vertical smoothing factors according to the intervals of the observation sites. In addition, we considered several tens kilometers electrode spacing for the measurement of voltage differences. And we were able to get much clearer overall resistivity structure to explain the observed Network-MT data set and have a rough grasp of the resistivity structure beneath whole Kyushu. One of the resistivity models, whose profile goes along around the Kirishima volcano group, we obtained a remarkable conductor beneath the Kirishima volcano which shows a good agreement with the previous result of ULF MT survey (Ichiki et al., 2000). Further, we found that the bottom of this conductor extends to the subducting Philippine Sea Plate. Then we carried out a three-dimensional inversion analyses to take account of the effects of the three-dimensional geographical features, especially, the ocean surrounding the Kyushu district. In this presentation, we would like to explain details of our reanalysis and obtained two-dimensional and three-dimensional models, and introduce the future direction of this study.

Network-MT, resistivity structure, subduction zone

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