Preliminary Results of a Magnetotelluric Survey in the Center of Hawaii Island

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Abstract
From 2010 to 2013 we have been recording magnetotelluric (MT) data at 19 sites in a 25 km by 25 km region around Kilauea Volcano. We have discovered during drilling of the HGRP drill hole that at depths of 100–200 m in the cores consisted of basaltic lava containing water. The shallowest low resistivities in our 2D model to the east of the summit was modeled with a 5 ohm-m conductor at a depth of 100 m.

Results

Five-component (three magnetic, two electric) MT data were collected at each site using a commercial software package, MTPlot. The resulting impedances were then used to determine the extent of the fresh-water and geothermal energy reservoirs that we discovered during drilling.

Discussion

MT data for constructing models have been processed at 9 sites. Of these, data for 4 sites were processed at 250 m (Fig. 3) after removing the high resistivities from the 2D model obtained by inverting the MT data for site 1 (Fig. 1). The vertically polarized (TE) mode was used to test the validity of the results but our results suggest that these extensions are > 5 km.

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