



Geophysical prospecting for the deep geothermal structure of the Zhangzhou basin, Southeast China

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Zhangzhou basin located at the Southeast margins of Asian plate is one of the largest geothermal fields in Fujian province, Southeast China. High-temperature natural springs and granite rocks are widely distributed in this region and the causes of geothermal are speculated to be involved the large number of magmatic activities from Jurassic to Cretaceous periods. To investigate the deep structure of Zhangzhou basin, magnetotelluric and gravity measurements were carried out and the joint inversion of magnetotelluric and gravity data delineated the faults and the granites distributions. The inversion results also indicated the backgrounds of heat reservoirs, heat fluid paths and whole geothermal system of the Zhangzhou basin. Combining with the surface geological investigation, the geophysical inversion results revealed that the faults activities and magma intrusions are the main reasons for the formation of geothermal resources of the Zhangzhou basin. Upwelling mantle provides enormous heats to the lower crust leading to metamorphic rocks to be partially melt generating voluminous magmas. Then the magmas migration and thermal convection along the faults warm up the upper crust. So finally, the cap rocks, basements and major faults are the three favorable conditions for the formation of geothermal fields of the Zhangzhou basin.