

INTISARI

INVERSI DUA DIMENSI DATA MAGNETOTELLURIK PADA LAPANGAN PANAS BUMI TONGARIRO

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Subduksi Lempeng Pasifik ke bawah Lempeng Indo-Australia menghasilkan aktivitas vulkanik di Tongariro. Aktivitas vulkanik di Tongariro menimbulkan aktivitas panas bumi, salah satunya pada lapangan panas bumi Tongariro. Penelitian ini menggunakan metode magnetotellurik (MT) untuk mengetahui persebaran resistivitas dan struktur bawah permukaan lapangan panas bumi di Tongariro. Penelitian dilakukan karena pengukuran MT sebelumnya masih berupa pemodelan 1-D dan belum dapat memodelkan persebaran resistivitas dan batas kontinuitas alterasi hidrotermal. Data MT yang digunakan dalam penelitian ini berjumlah 16 titik MT dengan tiga lintasan pemodelan.

Metode olah data dan inversi yang digunakan adalah algoritma *Non Linear Conjugate Algorithm* (NLGC). Hasil pemodelan inversi 2-D data MT menunjukkan anomali konduktif (4 - 32 ohm.m) dan anomali resistif (512 ohm.m) di bagian tengah semua lintasan pemodelan pada kedalaman 0 - 1,6 km. Anomali konduktif mengindikasikan keberadaan alterasi hidrotermal. Kehadiran lapisan resistif mengindikasikan keberadaan batuan andesit. Secara keseluruhan persebaran resistivitas dan alterasi hidrotermal di Lapangan Panas Bumi Tongariro dapat dipetakan dengan baik pada kedalaman dangkal karena algoritma inversi yang optimal dalam memproses data 1-D dan 2-D pada kedalaman 0 - 1,6 km. Kesimpulannya, hasil pemodelan 2-D hasil penelitian kali ini dapat menggambarkan struktur bawah permukaan dan persebaran alterasi hidrotermal pada kedalaman dangkal di Tongariro.

Kata-kata kunci: Tongariro, magnetotellurik, pemodelan, inversi

ABSTRACT

TWO DIMENSIONAL INVERSION OF MAGNETOTELLURIC DATA IN TONGARIRO GEOTHERMAL FIELD

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Subduction of the Pacific Plate under the Indo-Australian Plate produces volcanic activity at Tongariro. Volcanic activity in Tongariro causes geothermal activity, one of which is the Tongariro geothermal field. This study uses the magnetotelluric (MT) method to determine the distribution of resistivity and subsurface structure of the geothermal field in Tongariro. The research was conducted because the previous MT measurements were still in the form of 1-D modeling and had not been able to model the distribution of resistivity and hydrothermal alteration continuity limits. The MT data used in this study amounted to 16 MT points with three modeling paths.

The data processing and inversion method used is the Non Linear Conjugate Algorithm (NLGC). The 2-D inversion modeling of MT data shows a conductive anomaly (4 - 32 ohm.m) and a resistive anomaly (512 ohm.m) in the middle of all modeling line. The conductive anomaly indicates the presence of hydrothermal alteration. The presence of a resistive layer indicates the presence of andesite rocks. Overall, the distribution of resistivity and hydrothermal alteration in the Tongariro Geothermal Field can be mapped well at shallow depths because the inversion algorithm is optimal in processing 1-D and 2-D data at a depth of 0 - 1,6 km. The conclusion is the 2-D modeling results from this study can describe the subsurface structure and distribution of hydrothermal alteration at shallow depths in Tongariro.

Keywords: Tongariro, magnetotelluric, modelling, inversion