

INTISARI

PEMODELAN INVERSI 2D DATA AUDIO MAGNETOTELLURIK MENGUNAKAN DATA TERKOREKSI *STATIC SHIFT* METODE *AVERAGING* PADA LAPANGAN PANAS BUMI KADIDIA

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Energi panas bumi adalah sumber energi terbarukan dengan emisi karbon rendah. Indonesia memiliki potensi panas bumi besar, mencapai 23,6 GW, tetapi baru 10% yang dimanfaatkan. Metode Audio Magnetotellurik (AMT) digunakan dalam eksplorasi panas bumi untuk memetakan batas resistivitas rendah bawah permukaan sebagai indikator lapisan penudung, dimana batas bawah lapisan penudung merupakan batas atas zona reservoir.

Efek *static shift* akibat morfologi daerah penelitian dapat mengurangi keakuratan interpretasi data resistivitas sehingga perlu dikoreksi. Koreksi *static shift* dengan metode *averaging* diharapkan dapat meningkatkan akurasi data dan identifikasi reservoir.

Inversi 2D data AMT Lapangan Panas Bumi Kadidia menggunakan algoritma *Non-linear Conjugate Gradient* (NLCG). Data sebelum terkoreksi dan setelah terkoreksi *static shift* dimodelkan. Model dengan data terkoreksi menunjukkan lapisan dibawah titik MTKD-35 menjadi lebih resistif yang sesuai dengan kondisi geologi yang ada yaitu batuan granit. Secara kuantitatif nilai *misfit* pada model terkoreksi lebih rendah dibandingkan sebelum terkoreksi. Model menunjukkan nilai resistivitas rendah (<35 Ohm.m) pada kedalaman 500 m -1200 m diinterpretasikan sebagai sedimen teralterasi. Zona resistivitas sedang (35-65 Ohm.m) pada kedalaman 1200 m -1700 m dibawah lapisan konduktif diinterpretasikan sebagai zona reservoir. Nilai resistivitas tinggi (>160 Ohm.m) di area tenggara daerah penelitian diinterpretasikan sebagai batuan granit yang diduga sebagai sumber panas.

Kata Kunci : Audio magneotellurik, *static shift*, metode *averaging*, inversi 2D, resistivitas

ABSTRACT

*2D INVERSION MODELING OF AUDIO-MAGNETOTELLURIC DATA USING
STATIC SHIFT CORRECTED DATA WITH AVERAGING METHOD IN THE
KADIDIA GEOTHERMAL FIELD*

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Geothermal energy is a renewable energy source with low carbon emissions. Indonesia has significant geothermal potential, reaching 23.6 GW, but only 10% has been utilized. The Audio Magnetotelluric (AMT) method is used in geothermal exploration to map low-resistivity subsurface boundaries as an indicator of the caprock layer, where the lower boundary of the caprock marks the upper boundary of the reservoir zone.

The static shift effect due to the morphology of the study area can reduce the accuracy of resistivity data interpretation, making correction necessary. Static shift correction using the averaging method is expected to improve data accuracy and reservoir identification.

A 2D inversion of AMT data from the Kadidia Geothermal Field was conducted using the Non-linear Conjugate Gradient (NLCG) algorithm. Both uncorrected and static shift-corrected data were modeled. The corrected data model shows that the layer beneath MTKD-35 becomes more resistive, aligning with the existing geological conditions, which consist of granite rocks. Quantitatively, the misfit value in the corrected model is lower than in the uncorrected one. The model indicates a low-resistivity zone (<35 Ohm.m) at depths of 500 m - 1200 m, interpreted as altered sediments. A moderate resistivity zone (35-65 Ohm.m) at depths of 1200 m - 1700 m beneath the conductive layer is interpreted as the reservoir zone. A high-resistivity value (>160 Ohm.m) in the southeastern part of the study area is interpreted as granite rock, suspected to be the heat source.

Keywords : Audio magneotellurik, static shift, averaging method, 2D inversion, resistivi