

INTISARI

ANALISIS DIMENSIONALITAS DATA DAN PEMODELAN INVERSI 2D DATA MAGNETOTELLURIK PADA ZONA SUBDUKSI LEMPENG GORDA, AMERIKA UTARA

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Lempeng Gorda berada di sebelah barat lempeng Amerika Utara dan merupakan bagian paling selatan dari sistem subduksi Cascadia. Pada zona subduksi lempeng Gorda, terdapat berbagai fitur geologi kompleks di permukaan lempeng Amerika Utara yang mempengaruhi karakteristik dimensionalitas data dan variasi distribusi resistivitas bawah permukaan. Penelitian ini menggunakan 19 data MT dari EarthScope USArray-*National Science Foundation* (NSF). Data yang digunakan adalah berupa *file* dalam format EDI dan memiliki rentang periode 10^1 – 10^4 s.

Analisis dimensionalitas data magnetotellurik dengan menggunakan parameter tensor fase pada daerah penelitian menunjukkan bahwa sebesar 57% merupakan data berdimensi 3D dari keseluruhan data yang digunakan. Hasil pemodelan inversi 2D magnetotellurik menunjukkan nilai rms model secara keseluruhan sebesar 2,9. Sebaran nilai resistivitas yang dipetakan oleh model inversi 2D pada zona subduksi lempeng Gorda, meliputi fitur resistif ($< 400 \Omega\text{m}$) yaitu lempeng Gorda, sisa lempeng Farallon dibawah negara bagian Nevada dan Utah, dan Colorado *Plateau*. Zona konduktif ($< 50 \Omega\text{m}$) ditemukan pada jajaran busur vulkanik Cascadia, *upwelling asthenospheric*, *Basin and Range Province*, dan *Middle Rocky Mountain*. Selain itu, korelasi hasil inversi 2D dengan inversi 3D dari penelitian sebelumnya menunjukkan kemiripan sebesar 46%.

Kata kunci: magnetotellurik, tensor fase, zona subduksi lempeng Gorda, inversi 2D.

ABSTRACT

DATA DIMENSIONALITY ANALYSIS AND 2D INVERSION MODELLING OF MAGNETOTELLURIC DATA IN THE GORDA PLATE SUBDUCTION ZONE, NORTH AMERICA

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The Gorda plate is located to the west of the North American plate and is the southernmost part of the Cascadia subduction system. In the Gorda Plate subduction zone, there are various geological features on the North America surface that correspond to data dimensionality characteristics and subsurface resistivity distribution variations. The study used 19 MT data from EarthScope USArray-the National Science Foundation (NSF). The data were in the EDI file format and have a period range of 10^{-1} - 10^4 s.

Dimensionality analysis of magnetotelluric data using phase tensor parameters in the study area shows that the data consist of 57% consist of 3D data. The 2D inversion modelling was obtained with 2.9 rms value. The distribution of the resistivity from 2D inversion in the Gorda Plate subduction zone consist of resistive zone ($>400 \Omega\text{m}$) in the Gorda plate, remaining of the Farallon plate under the states of Nevada and Utah, and the Colorado Plateau. Conductive zone ($<50 \Omega\text{m}$) is imaged beneath the Cascadia volcano, upwelling asthenospheric, Basin and Range Province, and the Middle Rocky Mountain. Additionally, the correlation result between 2D inversion model and previous 3D inversion study is 46%.

Keywords: magnetotelluric, phase tensor, Gorda plate subduction zone, 2D inversion