# Studi komparasi respon struktur patahan daerah panasbumi antara 3d forward modeling data magnetotellurik dan gravitasi = Comparative study of the fault structure responses in geothermal area derived from 3d forward modeling of magnetotelluric and gravity data

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Abstrak

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Eksplorasi merupakan sebuah tahapan yang memiliki resiko tinggi di suatu proyek panas bumi. Salah satu target eksplorasi adalah zona permeabilitas tinggi. Zona permeabilitas tinggi berasosiasi dengan struktur bawah permukaan, seperti struktur patahan di daerah sistem panas bumi. Metode magnetotellurik MT dan gravitasi dapat digunakan untuk mendelineasi keberadaan sebuah struktur. Forward modeling 3D dilakukan untuk mendapatkan karakteristik dari diagram polar, induction arrow, FHD First Horizontal Derivative dan SVD Second Vertical Derivative dari berbagai variasi model sintetik struktur patahan yang selanjutnya diimplementasikan ke data MT riil dan data gravitasi riil. Diagram polar akan sejajar struktur ketika di zona yang lebih konduktif dan akan tegak lurus ketika di zona yang lebih resistif, sudut kemiringan berpengaruh terhadap pemipihan diagram polar. Induction arrow akan menunjukan zona konduktif. Respon dari model sintetik MT tidak bisa membedakan jenis patahan. FHD dipengaruhi kemiringan patahan tetapi tidak dipengaruhi jenis patahan. SVD dipengaruhi kemiringan dan jenis patahan. Hasil dari pengolahan data riil diketahui bahwa struktur patahan didominasi arah Utara-Selatan. Teridentifikasi terdapat 3 patahan dari analisis derivatif gravitasi.
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ABSTRACT<br>
Exploration is a high risk stage in geothermal project. One of the geothermal exploration target is a zone of high permeability. The high permeability zones are associated with subsurface structure, like fault structure on geothermal system area. Magnetotelluric MT and gravity methods can be utilized to delineate the existence of fault structure. In this research we made forward modeling for synthetic model MT data and gravity data. 3D forward modeling is carried out to have knowledge about characteristics of polar diagram, induction arrow, FHD First Horizontal Derivative , and SVD Second Vertical Derivative of various synthetic model fault structure to be implemented on real MT and Gravity Data. Polar diagram will be parallel to the strike when in the conductive zone and will be perpendicular to the strike when in the resistive zone, the smaller angle of strike slope form of the polar diagram will be more flattened. Induction arrow could show where the conductive zone. Synthetic model MT responses can not provide information on the type of structure. FHD is influenced by dip the fault but not influenced by the type of fault. SVD is influenced by dip and the type of fault. The results obtained from the real MT and gravity data known that fault structure dominated direction in N S. There are There are 3 fault identified by FHD and SVD methods.