

**INTI SARI**

**PENDUGAAN KEBERADAAN PATAHAN PADA SISTEM  
PANASBUMI GUNUNG TALAMAU MENGGUNAKAN DATA  
GEOMAGNETIK DENGAN ANALISA *DERIVATIVE* DAN *RADIAL  
AVERAGE POWER SPECTRUM***

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Salah satu daerah di Indonesia dengan potensi energi panasbumi terletak pada daerah Talu dan Tombang, Kecamatan Talamau, Sumatera Barat. Berdasarkan penyelidikan pendahuluan oleh Pusat Sumber Daya Geologi, manifestasi mata air panas pada daerah tersebut diduga memiliki sumber panas yang berasal dari Gunung Talamau, pendugaan ini memerlukan bukti pendukung berupa kemenerusan struktur pada daerah manifestasi terhadap sumber panas yang berada di sekitar Gunung Talamau. Penelitian ini bertujuan untuk mengetahui lokasi dan orientasi struktur disekitar Gunung Talamau berdasarkan metode geomagnetic, serta kemenerusan struktur pada Gunung Talamau terhadap lokasi manifestasi.

Daerah Penelitian terletak pada koordinat 610749.00 m E - 618386.00 m E dan 7259.00 m N - 11477.00 m N. Pengambilan data dilakukan secara gridding pada 120 titik dengan metode *base-rover*. Data lapangan yang didapatkan kemudian dilakukan proses koreksi diurnal dan koreksi IGRF untuk menghilangkan efek variasi medan magnet harian dan efek medan magnet utama bumi. Transformasi *Reduce to Magnetic Pole* diterapkan pada data untuk menghilangkan efek dipole anomali, *Bandpass Filter* digunakan untuk pemisahan anomali regional-lokal, *Total Horizontal Derivative* serta *First Vertical Derivative* diterapkan untuk memperjelas pola-pola menerus yang diakibatkan oleh adanya batas-batas struktur. Nilai kedalaman anomali lokal-regional didapatkan dari analisa grafik power-bilangan gelombang yang merupakan hasil dari *Radial Average Power Spectrum*.

Hasil dari proses interpretasi menunjukkan bahwa terdapat kelurusan antara pendugaan sesar berdasarkan peta *Total Horizontal Derivatif* dengan arah orientasi barataut-tenggara terhadap keberadaan manifestasi, serta terdapat keberadaan sumber panas Gunung Talamau pada kedalaman >500m berdasarkan analisa grafik *Radial Average Power Spectrum* dan peta anomali medan magnet regional.

**Kata Kunci:** geomagnetik, *radial average power spectrum*, panasbumi.

## **ABSTRACT**

# **ESTIMATION THE EXISTENCE OF STRUCTURES IN Mt. Talamau's GEOTHERMAL SYSTEM USING GEOMAGNETIC DATA WITH DERIVATIVE ANALYSIS AND RADIAL AVERAGE POWER SPECTRUM**

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One of the areas in Indonesia with geothermal energy potential is located in the Talu and Tombang areas, Talamau District, West Sumatra. Based on a preliminary investigation by the Geological Resource Center, the manifestation of hot springs in the area is suspected to have a heat source originating from Mount Talamau, this estimation requires supporting evidence in the form of structural continuity in the manifestation area of the heat source around Mount Talamau. This study aims to determine the location and orientation of the structure around Mount Talamau based on the geomagnetic method, as well as the continuity of the structure on Mount Talamau to the location of the manifestation.

The research area is located at coordinates 610749.00 m E - 618386.00 m E and 7259.00 m N - 11477.00 m N. Data were collected by gridding at 120 points using the base-rover method. The field data obtained are then carried out with diurnal correction and IGRF correction processes to eliminate the effects of daily magnetic field variations and the effects of the earth's main magnetic field. The Reduce to Magnetic Pole transformation is applied to the data to eliminate the anomalous dipole effect, Bandpass Filter is used to separating regional-local anomalies, Total Horizontal Derivative and First Vertical Derivative are applied to clarify continuous patterns caused by the presence of structural boundaries. The local-regional anomaly depth value is obtained from the analysis of the wavenumber power graph which is the result of the Radial Average Power Spectrum.

The results of the interpretation process indicate that there is a straightness between the fault estimation based on the Total Horizontal Derivative map with a west-southeast orientation towards the presence of manifestations, and there is the presence of Mount Talamau heat source at a depth of >500m based on the analysis of the Radial Average Power Spectrum graph and the regional magnetic field anomaly map.

**Keywords:** geomagnetic, radial average power spectrum, geothermal.