

## ABSTRACT

*This study aims to determine the subsurface structure of the Ketaun Segment in the GSF system based on gravity data inversion modeling. The study area is located in Lebong and Rejang Lebong Regencies, Bengkulu Province, which is part of the active fault system on the island of Sumatra. The data used is Global Gravity Model Plus (GGMPlus) satellite gravity anomaly data. Data processing was carried out through several stages of correction and analysis, including Bouguer correction, terrain correction, and separation of regional and residual anomalies using the Butterworth filter method. Subsurface modeling was performed in two-dimensional (2D) and three-dimensional (3D) forms using a least squares algorithm-based inversion method to obtain the distribution of subsurface rock density. Data processing and modeling were performed using Oasis Montaj and Zond software. The results showed that the fault structure in the Ketaun Segment could be identified based on the contrast in rock density that formed a linear pattern of gravity anomalies. 2D modeling on several southwest-northeast (SW-NE) oriented sections and 3D modeling showed the existence of a fault zone extending to a depth of about 3-5 km, with indications of a dominant horizontal fault structure associated with local normal faults. The distribution of rock density shows variations related to the presence of sedimentary, volcanic, and igneous rocks as bedrock. The results of this study are expected to provide information on subsurface conditions as a basis for geological disaster mitigation in the Bengkulu region.*

**Keywords :** *gravity, inversion, rock density, Ketaun Segment, Great Sumatran Fault*