ABSTRACT

East Kalimantan is characterized by complex geological conditions influenced by tectonic activity and variations in subsurface lithology. Information on subsurface geological structures is essenstial for understanding regional geological characteristics and the evolution of crustal structures in the area. This study aims to identify geological structures in East Kalimantan using global gravity data derived from the World Gravity Model 2012 (WGM2012). The analysis involves isostatic Complete Bouguer Anomaly (CBA) processing, spectral analysis using the Radially Averaged Power Spectrum (RAPS) to estimate the depth of anomaly sources and Moho, and several edge detection, including Horizontal Derivative (HD), First Vertical Derivative (FVD), Second Vertical Derivative (SVD), Analytic Signal (AS), Tilt Derivative (TDR), and THETA, to enhance and delineate structural boundaries. The result indicate that gravity anomaly values range from 10,40 hingga 63,76 mGal. Low anomaly zones occuring in the central–southeastern part of the study area are interpreted as low density sedimentary rocks, whereas higher anomalies in the northwestern and parts of the southern region suggest the presence of higher density rocks. Spectral analysis identifies anomaly sources at shallow depths of 0,62 km, intermediate depths of 3,29 km, and deeper sources at 19,08 km. Edge Detection filter reveal several fault structures predominantly trending northwest–southeast and southwest–northeast, indicating that the gravity anomaly configuration in East Kalimantan is largely controlled by regional fault systems.

***Keywords** : East Kalimantan, Edge Detection, Gravity Anomaly, Isostatic Complete Bouguer Anomaly, Moho Depth, Radially Averaged Power Spectrum*