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ABSTRACTS

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CRUSTAL THINNING AND WEDGE-TYPE STRUCTURE OF THE VIJAYAN COMPLEX: INSIGHTS FROM A 2D GRAVITY SURVEY

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The boundary between the Highland Complex and the Vijayan Complex of Sri Lanka represents a paleo plate boundary within the Precambrian basement, characterized by distinct lithological and geophysical contrasts. However, the subsurface structure and geodynamic evolution of the Vijayan Complex remain ambiguous, particularly regarding its crustal configuration and the geothermal activity of the region. Addressing this research gap, a 2D gravity survey was conducted along a 210 km profile, across the Highland/Vijayan boundary, with a nominal sampling interval of 500 m, which was reduced close to the known geological features with enhanced resolution. Sintrex CG-6 Autograv gravimeter was used for this survey. After applying necessary corrections, free-air and Bouguer gravity anomalies were calculated to analyze subsurface density variations. The results indicate a moderately constant gravity anomaly from the Highland Complex to the Highland–Vijayan boundary, followed by a significant increase in gravity with a steep gradient within the Vijayan Complex. This trend suggests progressive crustal thinning from the boundary towards the eastern coast. The interpreted model implies that the Vijayan Complex may exhibit a wedge-type crustal structure, thinning eastward. These findings provide new insights into the tectonic evolution of Sri Lanka that contribute towards refining the existing regional geodynamic models.

Keywords: 2D Gravity Anomaly, Highland Complex, Vijayan Complex, Free Air Anomaly, Crustal Thinning