

TECTONIC INTERPRETATION OF OBSERVED TOTAL MAGNETIC ANOMALIES OVER THE NORTH EASTERN PART OF DECCAN TRAPS AND ADJOINING AREAS OF CENTRAL INDIA

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Narmada-Son-lineament (NSL) is an important geomorphic feature of Central India. It is trending in the ENE-WSW direction, traversing the Indian shield from the west coast to Jabalpur region. All the geological and geophysical studies of this mega lineament conducted so far in the Jabalpur-Mandala region do not reflect tectonics and subsurface geology, because of extension and thickness of the trap below the alluvial and the sources of magma eruptions leading to Deccan traps volcanism. For a better evaluation of the trap thickness, location of intrusives and understanding tectonics of the region, a ground magnetic survey was carried out using a proton precession magnetometer with a sensitivity of 0.1 nT. The observations have been taken along all accessible roads at intervals of 2 to 5 km. The total field contour anomaly map was prepared on a scale of 1: 600,000 with 100 nT contour interval. The area under study extends over 10,000 km² bounded by latitude 22°22' to 23°30'N and longitude 79°30' to 81°18'E. The magnetic anomaly brings out several prominent anomalies observed over alluvial covered areas to the north of Jabalpur region indicating the extension of Deccan traps below the alluvial as well as the presence of several intrusive at depth. Magnetic interpretation as work out in the present study, predicts an average thickness of 0.6 km for the Deccan traps, besides bringing out shallow and deeper intrusive bodies at 1.5 and 4.5 km, respectively. The map reveals complex magnetic contours with several interesting anomalies attributable to dyke- and sheet-like bodies and Deccan traps. The anomalies are generally closed and aligned in the E-W to NE-SW direction. The studies reveal a strong magnetization contrast between trap and crystalline basement that varies from 600 to 900×10⁻⁵ emu suggesting that the intrusives are basic in composition.

Narmada-Son-lineament (NSL), ground magnetic survey, intrusives bodies, magnetization

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