Magnetic Anomalies and Basement Structure in Parts of Eastern Ghat Terrain and Adjacent Krishna-Godavari and Pranhita-Godavari Basins, Andhra Pradesh, India

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The thesis reports the analysis of magnetic anomalies reduced from a regional magnetic survey over the KG basin (referred as Area A), published aeromagnetic maps of AMSE (Airborne Mineral Survey and Exploration) wing of Geological Survey of India over the PG basin - Bastar craton area (referred as Area B).

Regional magnetic survey conducted over area A and a part of the KG basin(Fig1). The survey brought out a strong NE -SW trending anomaly in the area covered by the rocks of EGMB, and a mild ENE-WSW trending anomaly in the area covered by the sediments of the KG basin. The NE-SW trending anomaly in the northern half could be attributed to the exposed/near surface Charnockite basement that has come closer to the surface as a result of EGMB tectonics. Explanation of the mild ENE-WSW trending anomaly over the sediments of the KG basin required a faulted magnetic basement at depth downthrown towards the south. It is therefore concluded that the Charnockitic basement together with the Khondalite group of rocks which are folded and faulted during the different phases of tectonics of EGMB extend into the KG basin and further, were involved in faulting during the phases of formation and sedimentation in the KG basin.

Aeromagnetic anomalies over area B (Fig.1) could be attributed to NW-SE striking mafic intrusives in both the areas at variable depths. Such intrusions can be explained considering the collision of the Bastar and Dharwar cratons by the end of the Archaean and the development of tensile regimes that followed in the Paleoproterozoic, facilitating intrusions of mafic dykes into the continental crust. The inferred remanent magnetization of these dykes dips upwards and it is such that the dykes are oriented towards the east of the magnetic north at the time of their

formation compared to their present NW-SE strike. Assuming that there was no imprint of magnetization of a later date, it is concluded that the Indian plate was located in the southern hemisphere, either independently or as part of a supercontinent, for some span of time during Paleoproterozoic and was involved in complex path of movement and rotation subsequently.