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Anisotropy of Magnetic Susceptibility, Palaeomagnetism and Rock magnetic studies on mafic intrusives from Kaddam Fault: Implications to Godavari rift related magmatism

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Godavari graben is the Proterozoic rift system occupied by basin sedimentation; and any major magmatic episode is so far unreported. The Kaddam fault (Kf) representing a conjugate fault system of the Godavari rift is marked by mafic intrusive across the fault as well as along the fault within the granite-granulitic basement. The rock magnetic study shows ferrimagnetically rich assemblage with variety of domain size from Single Domain (SD) to Multi Domain (MD). Oriented samples were analysed for palaeomagnetic study using alternating field demagnetization and for Anisotropy of Magnetic Susceptibility (AMS) analysis to infer the petrofabrics. The characteristic mean palaeomagnetic directions (ChRM) for the dykes along and across the Kaddam fault shows two different temporal events or phases of intrusion. Further the AMS too shows a well clustered vertical K_{max} with flattening parallel to the dykes trending across the Kf. Whereas the dykes along Kf although are well clustered at sample level, shows at least two sets of K_{max} and K_{min} directions depicting internal deformation in response to strike slip movement reported based on field studies of Sangode et al. [1]. The REE geochemistry shows MORB association of these intrusive. Thus we infer rift related magmatism anticipating more such episodes under the thick sediment cover of Godavari graben basin that can be related to failed rifting of the greater Dharwar craton.

References:

[1] Sangode, S.J., Meshram, D.C., Kulkarni, Y.R., Gudadhe, S.S., Malpe, D.B. and Herlekar, M.A. (2013) Neotectonic response of the Godavari and Kaddam Rivers in Andhra-Pradesh, India: Implications to Quaternary reactivation of old fracture system. Jour. Geol. India 81(4), 459-471.

