

Magmatic Seismo-facies and Crustal Architecture Along Selected Profiles in Arabian Sea, West Coast of India

J. K. Samal, R. N. Dwivedy, and S. Mayor
KDMIPE, ONGC, Dehradun, Uttarakhand, India
jatinsamal@gmail.com, jatinsamal@yahoo.com

Comprehensive study has been carried out by integrating high resolution seismic, free air gravity and drilled well data to map magmatic seismo-facies across west coast of India and to infer crustal scale processes operating over there. Different episodes of magmatic activities might have modified the crustal scale geological features and influenced tectono sedimentation processes along West Coast Margin of India (WCMI). Various volcanic seismic facies units identified in the studied profiles are Landward Flows, Seaward Dipping Reflections (SDR), Volcanic Protrusions, Domes, Lower crustal reflector (LCR) and Intra basement reflector (IBR). The LCR below basement corresponding to the interface of upper crust and denser lower crust magmatic body has been mapped and it may also represent moho surface or top of under plated magmatic bodies. LCR along these two profiles mimic the free air gravity signatures. Based on prevalence of magmatic characteristics, the probable limit of continental crust domain has been identified. The deformations related to large scale intrusions of Laccadive ridge giving rise to collapsed extensional grabens have been documented. Listric normal faults detaching at LCR level and giving rise rollover structures of layered volcanic have been observed to the east of Laccadive ridge. The massive intrusive body below Laxmi ridge could be observed in the seismic. Low gravity observed over Laxmi ridge may be attributed to downwrapping at LCR (?moho), formed due to the load/ overcrusting of excess magmatic materials below Laxmi ridge. The present model and approach will help in assessing exploration risk and reduce risk and uncertainties in exploration programme in deep water areas.