

Tectonic Evolution of the Eastern Continental Margins of India and Adjoining Deepwater Areas of the Bay of Bengal: A Synthesis of Recent Geophysical Investigations

M Radhakrishna, Department of Earth Sciences, Indian Institute of Technology Bombay, Powai, Mumbai 400 076, India, E-mail: mradhakrishna@iitb.ac.in

The rifting and breakup of India from its eastern Gondwanaland counterpart, the East Antarctica, had resulted in the formation of the Eastern Continental Margin of India (ECMI). Subsequent major geological events such as the collision of India with Eurasia, regional plate reorganizations and plume interactions led to complexities and hindered clear understanding of tectonic evolution of this margin. Further, the spatial and temporal variations in sedimentation pattern define the present day basin configuration with thick sediments in the shelfal and deep oceanic areas of the margin. Though, earlier geophysical studies along the ECMI revealed rift-related horst-graben morphology below the onshore-offshore basins, rift-shear tectonic affinity for the initial breakup and crustal structure in different segments of the margin, detailed geophysical data interpretation during last 10 years in this region have brought out significant new information with regard to crustal architecture, breakup history, continent-ocean transition, sedimentation and mode of emplacement of the aseismic ridges. The deep seismic reflection imaging and constrained potential field modeling in different segments of the ECMI along with magnetic anomaly identifications of the conjugate East Antarctica margin suggests: i) double breakup (India-East Antarctica-Elan Bank) scenario for the evolution of ECMI, ii) significant along margin variation in crustal structure, iii) a wide crustal transition zone with presence of proto-oceanic crust at few places, iv) volcanic nature of the 85°E Ridge and its emplacement at the ECMI, v) the NW-SE trending fracture zone trends in the adjoining Bay of Bengal oceanic crust. I will be presenting in this talk some of these salient results with an aim to provide tectonic evolution of the margin, and at the same time discuss various knowledge gaps and conflicting opinions that have emerged.