



## **High-resolution Plate Reconstruction Models for the Central Indian Ocean Between Chrons 34 to 20 (83 to 42 Ma)**

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The Indian Ocean is the result of East Gondwanaland fragmentation and dispersal since Jurassic. The complex seafloor spreading history of this region is related with several major events such as the Kerguelen and Reunion hotspot inception and the Indo-Eurasian collision. Indian and French scientists have collected a large amount of marine geophysical data in the conjugate basins of the northern and southern Indian Ocean, respectively. Using these data and under the auspices of an Indo-French collaborative project, we revisited the Central Indian (CIB), Crozet (CZB) and Madagascar (MDB) basins to understand their evolution. We created a common database consisting of magnetic data from 148 cruises belonging to the Indian and French scientists along with the so-called international data archived at NGDC. From these magnetic profiles, (1) we identified the anomalies using the inter-profile correlation and forward modelling as well as a detailed analysis of the characteristic shape of the anomalies (including the tiny wiggles); (2) we precisely located the magnetic isochrons using the analytic signal technique; and (3) we validated these isochrons by plate reconstructions. The analysis resulted in an updated magnetic isochrons map of the Central Indian, Crozet and Madagascar basins between chron 34ny (83 Ma) and chron 20ny (42.5 Ma), where the fracture zones were constrained by the satellite altimetry derived free air gravity anomaly map. The 1399 magnetic anomaly crossings (846, 287 and 266 picks from CIB, CZB, and MDB respectively) enabled us to estimate improved finite rotation parameters for Indian-Antarctic and Indian-African plate boundaries, which enabled preparation of better constrained high-resolution plate reconstruction models of the Central Indian Ocean for closer time intervals ( $\sim 2$  Ma). These magnetic anomaly picks and rotation parameters could also be used for a better tracing of the Indian Ocean Triple junction in the Central Indian Basin (CIB) and thereby defining the eastern and western parts of the CIB which are conjugate to the Crozet and Madagascar basins, respectively.