



Kinematic evolution of the Arabia-India-Somalia triple junction since 20 Ma from new magnetic data

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Magnetic data acquired during a geophysical survey of the Aden-Owen-Carlsberg triple junction (AOC cruise, *RV Beautemps-Beaupré*, 2006) and all available magnetic data across the eastern Gulf of Aden and the NW Arabian Sea are used to reconstruct the evolution of the triple junction where the Sheba and Carlsberg ridges meet the Owen Fracture Zone. The connection between these structures is however not clearly delineated and the triple junction presently corresponds to a widespread zone of distributed deformation. In the triple junction area, the easternmost part of the Sheba Ridge is made up of two segments exhibiting distinct morphologic, tectonic, magmatic, and magnetic features. The western segment (west of 57.2°E) is characterized by a typical morphology of slow-spreading ridge with a median rift bounded by steeply-dipping normal faults and a spreading axis marked by a neovolcanic ridge. The amplitude of magnetic anomalies is high and the Bouguer anomaly is relatively low. In contrast, the eastern segment displays an axial rift more sinuous and deeper, bounded on either side by oceanic core complexes (see companion Abstract by Chamot-Rooke et al., this meeting), and marked by spotted volcanism. It is characterized by low-amplitude magnetic anomalies and high Bouguer gravity, and thus appears as a less magmatic segment than the western one. Magnetic anomalies have been identified from An 2A to An 6 (20 Ma) on both flanks of the Sheba Ridge. The anomaly 6 is the oldest anomaly recognized along the Sheba Ridge. Sea-floor spreading between the Arabia and Somalia plates therefore started in the eastern Gulf of Aden ca. 20 Ma

ago, just before anomaly 6. On the northern flank of the Sheba Ridge, the magnetic isochrons are shifted dextrally between the western and the eastern segment. Since at least the anomaly 5 (10 Ma), the rate of spreading on the eastern segment is slower than on the western one and it is compatible with the spreading rate of the Carlsberg Ridge. The easternmost segment of the Sheba Ridge therefore appears to pertain to the Carlsberg Ridge since at least 10 Ma. Since that time, a portion of the Arabian plate has transferred to the Indian plate.