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Seafloor spreading history in the Natal Valley and Mozambique Ridge deduced from vector magnetic anomalies

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The break-up of Gondwana is the important geological event to have affected the southern hemisphere in the past 200 Myr. The seafloor spreading history revealed by the geophysical survey around the Southern Ocean is one of the vital key to understanding the timing and geometry of early Gondwana break-up. However, magnetic anomaly lineations are less well defined because the existing marine magnetic data are still poor resolution especially in South Indian Ocean.

To reveal more detailed seafloor spreading history in this region during the initial break-up of Gondwana, the shipboard three components magnetic survey were carried out for the first time in the Natal Valley and the Mozambique Ridge off South Africa, using the R/V Pelagia operated by the Nederlands Instituut voor Onderzoek der Zee (NIOZ) from 9th April to 1st June 2009.

In northern Natal Valley, complicated strike patterns of magnetic structure are shown, and trends of magnetic anomalies are not consistent with trends of magnetic isochrons reported in previous study. Additionally, characteristic trends are observed between S28/E34.5 and S27/E35. We will present vector magnetic anomaly features in the Natal Valley and the Mozambique Ridge, and discuss the seafloor spreading process in this region.

Keywords: vector magnetic anomalies, magnetic lineation, Gondwana breakup, Natal Valley, Mozambique Ridge