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New findings on the structure of the Mozambique Ridge

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Abstract

The Mozambique Ridge (MozR) is located in the southwestern Indian Ocean and is discussed as a part of the South African Large Igneous Province (LIP). It consists of four major geomorphological units, which are associated with multiple phases of volcanic activity between 140 Ma to 120 Ma. This project tries to decipher the role of the Mozambique Ridge within the break-up of Gondwana as well as its influence on climate and oceanic circulation. In order to address these open questions high resolution seismic reflection data was gathered during cruise SO-232.

Seismic reflection data reveals various magmatic centres and internal reflections that extend up to several hundred ms TWT into the basement. Especially at the transition zones between the segments of the MozR a number of internal reflection bands demonstrate discordant bedding to each other. These findings support the assumption of a gradual development of the MozR. In addition it underlines the previous suggestion that it is of LIP origin.

Several prominent unconformities can be observed within the survey area, clearly distinguishing episodes of strong erosion from those with current controlled sedimentation. Due to their relative continuity, those current controlled structures can be used to reconstruct the paleopathways of the ocean circulation system.

Previous findings regarding the location and pathways of the oceanic currents are extended and depicted in greater detail with the gathered data. This will lead to a better understanding of the development of the gateway south of South Africa associated with the Gondwana break-up and the circulation of the Indian Ocean in general.

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