The magmatic structure of the Mozambique Ridge

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The Mozambique Ridge (MozR) is located in the southwestern Indian Ocean and is discussed as 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 and 120 Ma. This project tries to decipher the gradual development of the Mozambique Ridge as well as its role within the break-up of Gondwana. In order to address these open questions high-resolution seismic reflection data was gathered during cruise SO-232 with RV Sonne.
Seismic reflection data reveals various magmatic centres and intra-basement reflections that extend up to several hundred ms TWT below top of basement. Such massive flows are characteristic of oceanic plateau eruptions. Primary volcanic features associated with the formation of the different segments of the MozR can be identified and separated from secondary volcanic features, indicating magmatic reactivation after its initial build-up. The internal reflections generally dip away from their magmatic centres and individual reflectors are typically traced 5-15 km. Various faults cutting through basement and sedimentary units are interpreted as extensional tectonic features.
These observations imply that MozR is of LIP origin and underwent multiple magmatic and tectonic phases during its development. This will lead to a better understanding of the opening of the South African gateway associated with the Gondwana break-up and the development of the MozR as a LIP in general.