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Results of recent investigations of the conjugate margins in the Africa-Antarctica Corridor

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Even if much work has yet been done to recognize the details of the Gondwana puzzle and the movements between its parts during the dispersal of the supercontinent, there remain still many unsolved questions concerning the exact positions and movements of all of its components.
The tectonic spreading between Antarctica and Africa in the geological past is directly constrained only by the stripe of seafloor, which underlies the Africa-Antarctica Corridor (AAC).
From 2003 to 2009, a considerable amount of geophysical data has been obtained on both (conjugate) sides of that corridor.
Two parallel seismic refraction lines were obtained in the Mozambique Channel, crossing the shoreline of Central Mozambique. The data show that the Continent-Ocean-Transition is located closer to the shoreline than supposed and is underlain by a high-velocity body with velocities up to 7.5 km/s.
A large part of the Mozambique Channel was covered by systematic potential field measurements as was the case for the Mozambique Ridge (MOR) and the Northern and the Southern Natal Valley (NNV resp. SNV).
In the Mozambique Channel, we succeeded to identify magnetic spreading anomalies up to M33n, which gives evidence of the onset of oceanic seafloor spreading at 166 Ma at latest.
Along the conjugate margin of Antarctica, systematic magnetic and gravity data were collected on the Astrid Ridge and in the Riiser-Larsen Sea, where the M-series up to M25n are clearly identifiable. The new data on the Astrid Ridge (AR) reveal a weakly negatively magnetized southern part, whereas its northern part is magnetically expressed by strong positive anomalies. These anomalies show two oblique directions hinting to a creation of the northern part of the Astrid Ridge on the meeting point of the Astrid Fracture Zone with another spreading regime.
The magnetic data on the MOR reveal a pattern of seafloor spreading anomalies, which gives evidence of a mainly oceanic nature of the ridge. The border between the NNV and the MOR is marked by the Ariel Graben, which finds its expression in a remarkable negative anomaly of up to -780 nT in the magnetic and of up to -260 mGal in the free-air-gravity field. The magnetic pattern of the NNV is similar in character to that of the MOR and shows several linear, but not unequivocal trends.
The free-air gravity data reveal the NNV and the Coastal Plains of Southern Mozambique being one contiguous province as do the existent magnetic data. Thus, we interpret the crust reaching from the Mateke-Sabi Monocline, which is the northern borderline of the Mozambique Coastal Plains, to the southern tip of the MOR as being of mainly oceanic nature. The existence of smaller continental fragments within cannot be excluded, indeed.
The synopsis of the data provides new constraints for the early post-breakup movements between East and West Gondwana.