Geophysical Research Abstracts
Vol. 17, EGU2015-3689, 2015
EGU General Assembly 2015


# Northern Mozambique: Crustal structure across a sheared margin

Maren Bätzel (1), Dieter Franke (2), Ingo Heyde (2), Bernd Schreckenberger (2), and Wilfried Jokat (1)

(1) Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research (AWI), Bremerhaven, Germany (maren.baetzel@awi.de), (2) Federal Institute for Geosciences and Natural Resources (BGR), Hannover, Germany

The rifting of Gondwana started some 180 million years ago. The continental drift created some of the oldest ocean basins along Eastern Africa, the Somali and the Mozambique basins. As a consequence of the relative movements between Africa and Antarctica-India-Madagascar a shear margin developed along the present day coastline of northern Mozambique and Tanzania. In addition, the N-S oriented offshore Davie Ridge is believed to have formed during the shear movements between both parts of Gondwana. However, whether the Davie Ridge is of continental origin or has been formed by magmatic processes during the continental drift is unknown, since any crustal information is missing so far. Previous studies in this area are rare and only few seismic reflection data sets from the 1970s and 1980s are available.

In 2014 four seismic refraction data along east-west-orientated profiles as well as gravity and magnetic field data across the Davie Ridge with RV Sonne were collected to determine its crustal composition as well as the position of the continent-ocean-transition. Here, we present a first P-wave velocity model across the Mozambican sheared margin at 13º S. The profile is situated in a region where the ridge topography vanishes. In total, 20 OBS/OBH systems were used on profile 20140130 over the Davie Ridge. Most of the instruments recorded data with a very good quality. In the best records, P-wave phases can be observed at a source-receiver offset of 110 km.

The total thickness of the sediments is about 5 km in the Comores Basin and about 3 km offshore Mozambique. The sediments show at 3.5 and 5 km depth unusual high seismic velocities of 4.0-4.6 km/s. Our results indicate a shallow Moho close to the shelf break. Here, the crust thins to 4 km. This area is assumed to be the western part of the Davie-Ridge and might represent a sharp transition (50 km) from continental to oceanic crust, which is typical for a sheared margin. East of the Davie Ridge the data indicate a crustal thickness of 6 km, which is most likely of oceanic origin.