



Crustal structure of northwest Namibia in the Walvis Ridge region from receiver functions

Benjamin Heit (1), Xiaohui Yuan (1), Michael Weber (1), Wolfram Geissler (2), Wilfried Jokat (2), Bufelo Lushetile (3), and Karl-Heinz Hoffmann (3)

(1) GFZ German Research Centre for Geosciences, Potsdam, Germany (heit@gfz-potsdam.de), (2) AWI Alfred Wegener Institute, Columbusstrasse, 27568 - Bremerhaven, Germany, (3) Geological Survey of Namibia, 1 Aviation Road, Windhoek, Namibia

We operated for two years, a passive-source seismic network in the continental margin of northwestern Namibia at the ocean-continent transition in the region where the oceanic Walvis Ridge impinges the coast in the Kaoko province. The high-quality teleseismic records collected allow for a reliable H-k analysis of receiver functions. We present here the first map of crustal thickness and V_p/V_s ratio for northwestern Namibia. Over much of the study area the crust is ~ 35 km thick with a normal V_p/V_s ratio less than 1.75. Along the coast in the Kaoko Belt the crust thins to ~ 30 km. Strong variations in the crustal thickness and V_p/V_s ratio is found in the landfall of the Walvis Ridge, where the crustal thickness reaches 45 km with a high V_p/V_s ratio larger than 1.75. High V_p/V_s anomaly of >1.8 (locally reached 1.89) is found at the position of the northern Etendeka basalts. The high V_p/V_s is consistent with the high P wave velocities in the lower crust observed in this region, suggesting a process of magmatic underplating as a result of the mantle plume interaction that gave origin to the Walvis Ridge and Etendeka basalts.