Crust and upper mantle velocity structure beneath and surrounding the northern Lake Malawi/Nyasa Rift Basin from the SEGMeNT project

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Crustal and uppermost mantle structure beneath and surrounding the northern Lake Malawi/Nyasa rift basin has been investigated using broadband seismic data from 55 temporary land stations deployed between August 2013 and October 2015. P wave receiver functions have been modeled using (1) H-k stacking and (2) a joint inversion with Rayleigh wave phase velocities to obtain estimates of crustal thickness and Vp/Vs. Crustal thickness is fairly uniform across the network, with Moho depths mostly between 35 and 45 km and Vp/Vs ratios between 1.7 and 1.8. P and S travel times from teleseismic earthquakes have been inverted for upper mantle structure. A pronounced low wave speed anomaly is imaged beneath the Rungwe volcanic province at the northern end of the rift basin. Preliminary results suggest that the low wave speed anomaly extends to the southeast beneath the northeastern side of the basin. Travel times from earthquakes recorded on OBS deployed in the lake are being added to improve resolution beneath the axis of the rift.