Regional Phases from Earthquakes along the Western Branch of the East African Rift and Relocation of Epicentres between 1N and 12S

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Abstract

To improve earthquake locations, regional seismic phases, i.e., Pn, Pg, Sn and Sg (Lg) have been studied in the region bounding the western branch of the East African Rift System between 1N and 12S. We analysed arrival time data from 56 regional earthquakes recorded by a local network (Mbeya network) in south-western Tanzania, consisting of five three-component digital stations. The earthquakes were located by adding data from 17 stations of the East and Southern Africa Seismic Network (ESASN). Calculation of phase parameters and earthquake locations result from an interactive inversion of data. The resulting crustal model is characterised by an average velocity of 6.32 +- 0.26 km/s and 3.61 +- 0.02 km/s for P and S waves, respectively. Upper mantle velocities corresponding to Pn and Sn phases are 8.11 +- 0.05 km/s and 4.67 +- 0.05 km/s, respectively. Achieved velocities are comparable to those obtained for the African Shield. The crustal thickness is estimated to be 41.3 +- 7.5 km assuming that the av