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Crustal structure of some tectonic regions in West Africa

New estimates of Moho depth, Poisson's ratio and shear-wave velocities for fourteen seismological stations in Nigeria, Ghana, Mali and Cote d'Ivoire were obtained. The data used for this study was from teleseismic earthquakes recorded at epicentral distances between 30° and 90° and with moment magnitudes greater than or equal to 5.5. P-wave receiver functions were modeled using the Moho Ps arrival times, H-k stacking, and joint inversion of receiver functions and Rayleigh wave group velocities. The average Moho depth of the stations in the Neoproterozoic Nigeria basement complex is 36 km, and 23 km for the stations in the Cretaceous Benue Trough. The crustal structure of the Paleoproterozoic Birimian and Neoproterozoic Dahomeyan terrain and Togo Structural Unit in southern Ghana is similar, with an average crustal thickness of 43 km. Poisson's ratios for all the stations ranged from 0.24 to 0.26. The crustal structure of the Nigerian basement complex is similar to the average crustal structure of Neoproterozoic terrains in other parts of Africa, but the Neoproterozoic terrains in southern Ghana have a thicker crust with a thick mafic lower crust. The crustal thickness of the Birimian in Cote d'Ivoire and Taoudeni basin is 40 km and 36 km respectively.

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