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Crustal Structure of Ethiopian Plateaus and the Main Ethiopian Rift from Receiver Function Analysis

Thursday, June 22, 2023 11:35 AM (15 minutes)

P-to-S receiver functions of 10 broad-band seismographs installed along the geologically complicated edge of the Ethiopian plateau and the active Main Ethiopian Rift were examined to image the crustal structure beneath the region. Receiver functions were determined using the time domain iterative deconvolution method to calculate the Moho depth and Vp/Vs of the crust. Results indicate that the Moho depth beneath the Northwest plateau, the Central Main Ethiopian rift, and the Southeastern plateau is 36–44 km, 36–38 km, and 40–44 km, respectively. A very high Vp/Vs > 2.0 is observed beneath the Enewari depression at the NW plateau at the depth range of ~ 30–40 km under a high velocity material. Likewise, a similar high Vp/Vs material is also found beneath the rift axis at the depth range of ~ 30–46 km beneath a high velocity solidified material. These high Vp/Vs ratios at the top of the lower crust in the Northwest plateau and MER are inferred to be seismic signatures of a low Vs partial melt material. The high Vs and the low Vp/Vs material above these high Vp/Vs materials might be solidified magmatic material.

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Promotional text

Crustal structure of the Northwestern and Southeastern plateau from the analysis of Shear wave velocity obtained from the P- to -S wave receiver function analysis.

Oral preference format

in-person

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