



New constraints on Upper Mantle Dynamics beneath Bangladesh from the Analyses of Core-mantle Refracted SKS and SKKS Waves

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We obtained new shear wave splitting measurements from hitherto less studied Bengal Basin based on core refracted SKS and SKKS phases. Splitting parameters, time delays (δt) and fast polarization directions (Φ) were estimated through analysis of 64 high-quality waveforms (≥ 2.5 signal to noise ratio) from 29 earthquakes with magnitude ≥ 5.5 recorded at eight seismic stations deployed over Bangladesh. Our results indicate no evidence of splitting implying azimuthal isotropy beneath the region. Null measurements can be attributed to the near vertical axis of anisotropy or to the presence of multiple anisotropic layers with different fast polarization directions, where combined effect results in null. We consider that the presence of partial melts within the upper mantle in relation to the Kerguelen mantle plume activity may be the potential geodynamic cause for observed null measurements. We suggest that the plume activity locally perturbed mantle convection flow beneath the region and reoriented the lattice preferred orientation of the upper mantle mineral mainly olivine as this disabled the core refracted SKS and SKKS phases to scan the anisotropic characteristics of the region, and hence null measurements are observed.