

## Investigation of azimuthal variation in S-wave velocity in the western part of the Himalayas-Tibet Indo-Gangetic plains region using surface waves

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Group velocities of fundamental mode Rayleigh and Love waves in the period range 5 to 85 s are obtained in different azimuths with respect to Himalayan arc in the western part of Indo-Eurasia collision zone. We applied frequency time analysis and used multiple filter technique to calculate group velocity dispersion curves using regional earthquakes. The seismic waves recorded at two broadband seismograph stations of Himalayan region pass through Tibet, Ladakh-Kohistan, Karakoram, Indus Tsangpo Suture Zone, Tethyan Himalayas, Himalayan geotectonic units and western corner of Indo-Gangetic Plains (IGP). Dispersion curves of fundamental mode Rayleigh and Love waves show significant azimuthal variation. For the intermediate period (15 - 45 s), the Rayleigh wave velocity is significantly low and Love wave velocity is nearly constant for the wave paths crossing collision zone. Rayleigh wave velocity is lowest at ~30 s. Dispersion curves can be divided mainly into two groups with different characteristics for the Tibet-Himalayas and IGP. Small difference is also observed for the group of Tibet-Himalayan region of paths passing oblique and parallel to Himalayan arc. Low Rayleigh wave velocity for intermediate period of Tibet-Himalaya region may suggest partial melts in mid-crust while its difference with Love wave is attributed to radial anisotropy. The waves crossing through IGP has very low velocities for period less than 15 s portraying thick deposits of sediments.