CRUSTAL STRUCTURE AND DEFORMATION CHARACTERISTICS BENEATH THE VINDHYAN REGION AROUND ALLAHABAD

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Vindhyan basin is one of the largest Proterozoic sedimentary basins of India. Broad-band Earthquake records from seismic station (Allahabad) located at the northern edge of the Vindhyan basin have been analyzed to determine the crustal shear-wave velocity structure, average crustal thickness and Vp/Vs value. An average crustal thickness of about 47 km and Vp/Vs value of about 1.765 is obtained by analyzing the Moho converted Ps phases and their first order crustal reverberations. The detailed shear-wave velocity structure, determined by joint inversion of receiver functions and surface-wave dispersion data, illuminates a multi-layered seismic structure with crust-mantle boundary at a depth of 46 ± 1 km depth. Analysis of the splitting of the seismic shear-phases originating at the core-mantle boundary (SKS), recorded at various broad-band seismic stations located in the Indian subcontinent, suggest a complicated deformation related anisotropic pattern. The fast-axis direction of polarization of the SKS phases are generally consistent with the plate motion direction, except for Allahabad, which indicates almost E-W directed deformation pattern, possibly related with the origin of the Vindhyan basin.