

## **Determination of Crustal Structure and Moho Depth within the Jammu and Kashmir Region, Northwest Himalaya through Receiver Function**

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**Abstract :** The Jammu and Kashmir (J&K) region of Northwest Himalaya has a long history of earthquake activity which falls within Seismic Zones IV and V. To know the crustal structure beneath this region, we utilized teleseismic receiver function method. This paper presents the results of the analyses of the teleseismic earthquake waves recorded by 10 seismic observatories installed in the vicinity of major thrusts and faults. The teleseismic waves at epicentral distance between 300 and 900 with moment magnitudes greater than or equal to 5.5 that contains large amount of information about the crust and upper mantle structure directly beneath a receiver has been used. The receiver function (RF) technique has been widely applied to investigate crustal structures using P-to-S converted (Ps) phases from velocity discontinuities. The arrival time of the Ps, PpPs and PpSs+ PsPs converted and reverberated phases from the Moho can be combined to constrain the mean crustal thickness and Vp/Vs ratio. Over 500 receiver functions from 10 broadband stations located in the Jammu & Kashmir region of Northwest Himalaya were analyzed. With the help of H-K stacking method, we determined the crustal thickness (H) and average crustal Vp/Vs ratio (K) in this region. We also used Neighbourhood algorithm technique to verify our results. The receiver function results for these stations show that the crustal thickness under Jammu & Kashmir ranges from 45.0 to 53.6 km with an average value of 50.01 km. The Vp/Vs ratio varies from 1.63 to 1.99 with an average value of 1.784 which corresponds to an average Poisson's ratio of 0.266 with a range from 0.198 to 0.331. High Poisson's ratios under some stations may be related to partial melting in the crust near the uppermost mantle. The crustal structure model developed from this study can be used to refine the velocity model used in the precise epicenter location in the region, thereby increasing the knowledge to understand current seismicity in the region.

**Keywords :** H-K stacking, Poisson's ratios, receiver function, teleseismic

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