

Estimation of crust and upper mantle velocity structure of the Himalayas and North-Eastern part of India using surface wave data

*Mradula Vashishtha¹, Sagarika Mukhopadhyay¹

1. Department of Earth Sciences, Indian Institute of Technology Roorkee, Roorkee- 247667, India

Characteristics of dispersion curves of Rayleigh and Love waves of 2015 Nepal Earthquake and its aftershocks are utilized to investigate the sub-surface structural variations below the Himalayas and nearby regions. Surface waves of these earthquakes recorded in the broadband seismometers installed at Ajmer, Dehradun and Shimla were used for investigation. We have applied multiple filtering technique to obtain the group velocity curves. It is observed that group velocities for both Rayleigh and Love waves obtained using main shock data are consistently lower at all periods compared to those obtained using data from aftershocks for these three stations which lie in the western/southwestern side of the mainshock epicenter. It is reported by various researchers that during this earthquake slip along the fault was unidirectional, i.e. from west to east. We are investigating if the above observation related to differences in group velocity is anyway related to directionality of the faulting and are analyzing data from the eastern side of the mainshock epicenter. Inversion of dispersion curves of mainshock and aftershocks are performed to investigate subsurface shear wave velocity structure and variation of anisotropy with depth for crust and uppermost mantle.

Keywords: Group velocity, Dispersion curves, Rayleigh wave, Love wave, Himalayas