

Source Process of the $M_w = 5.1$, Phalla (Islamabad) Earthquake and Its Tectonic Perspective

The 2015 Phalla earthquake occurred near Islamabad, Pakistan with strong shaking but no damage report. We estimated the focal parameters and slip model of this earthquake by waveform modeling of the local data using moment tensor inversion. We analysis 25 station waveform data retrieved from MSSP (Micro seismic studies Programme). We found strike slip mechanism within thrusting tectonic environment. This right lateral strike slip fault compensates the movement of the left lateral strike slip Jhelum fault present in East. This ineterplate earthquake was largest strike slip event to occur in HKS (Hazara Kashmir Syntax). The spectral parameters were computed using Brune's model fitting of the data. The moment magnitude, fault length, static stress drop and radiated seismic energy were computed as 5.1, 1.5 km, 90 bar, and 9E11 J respectively. The same spectral analysis was applied to the aftershocks waveform data from near local stations. We tested the scaling of seismic spectrum, and the scale invariance of the apparent stress drop with the earthquake size. The existence of this strike slip mechanism within the subduction zone may play vital role in the segmentation of large thrust faults of the HKS zone which will in turn affect the seismic hazard estimation.

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Track Classification: 1. The Earth as a complex system