



## **Near-Fault Ground Motion Velocity Pulses Input and Its Non-Stationary Characteristics from 2015 Gorkha Nepal Mw7.8 Earthquake KATNP Station**

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Using near-fault strong motions from Nepal Mw7.8 earthquake at KATNP station in the city center of Kathmandu, velocity-pulse and non-stationary characteristics of the strong motions are shown, and the reason and potential effect on earthquake damage for intense non-stationary characteristics of near fault velocity-pulse strong motions are mainly studied. The observed strong ground motions of main shock were collected from KATNP station located in 76 kilometers south-east away from epicenter along with forward direction of the rupture fault at an inter-montane basin of the Himalaya. Large velocity pulse show the period of velocity pulse reach up to 6.6s and peak ground velocity of the pulse ground motion is 120 cm/s. Compared with the median spectral acceleration value of NGA prediction equation, significant long-period amplification effect due to velocity pulse is detected at period more than 3.2s. Wavelet analysis shows that the two horizontal component of ground motion is intensely concentration of energy in a short time range of 25-38s and period range of 4-8s. The maximum wavelet-coefficient of horizontal component is 2455, which is about four time of vertical component of strong ground motion. On the perspective of this study, large velocity pulses are identified from two orthogonal components using wavelet method. Intense non-stationary characteristics amplitude and frequency content are mainly caused by site conditions and fault rupture mechanism, which will help to understand the damage evaluation and serve local seismic design.