3D crustal velocity model around the source region of the 2015 Gorkha earthquake, central Nepal

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We investigate the 3D crustal structure of central Nepal in the source region of the 2015 Gorkha earthquake (M_w 7.8) by applying a seismic tomography inversion method. We use P- and S-wave traveltime data of the Gorkha earthquake sequence recorded by a temporary aftershock monitoring network of 42 stations and 1406 events, to determine Vp and Vp/Vs models of the region. Seismicity forms two separate east-west seismic belts located north and south of the main coseismic slip area. The width of the northern belt varies along-strike. First, we calculate a 1D velocity model of the area following the approach of Kissling et al. (1994) and relocate all the events in the database. With this 1D velocity model, we then use SIMUL2000 (Thurber and Eberhart-Phillips, 1999) to determine a coarse 3D velocity model. Finally, the grid spacing is made smaller to determine a detailed 3D velocity model. This study contributes to our knowledge of seismo-tectonics by providing a detailed velocity structure within the source region of the Gorkha earthquake. In addition, we hope to identify structural features that controlled the rupture limit of the main event.
Key words: *Seismic tomography, crustal structure, Nepal Himalaya, Gorkha earthquake*