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# Aftershock Catalog for the 2015 Gorkha Earthquake, Nepal
# 2015 年ネパールゴルカ地震の余震の自動震源決定

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The Gorkha earthquake (Mw7.8) occurred on April 25, 2015 in central Nepal. It caused significant damage: about 9000 people were killed and 22000 people were injured. Fifty days after the earthquake, Oregon State University in the United States operated temporal seismic networks in the epicentral area of the mainshock to record its aftershocks. About 11 months of data are now available on the IRIS Data Management Center website. We use 42 broadband and short-period seismograms of this dataset.

We processed this aftershock dataset in the following way. We corrected the instrumental response and applied 2-10Hz band-pass filter for the three component continuous waveforms. Then, the seismic phase arrivals were detected by Tpd method (Hildyard et al., 2008). The detected P-wave and S-wave arrivals together with the amplitude of P-waves were used for the localization of the event. The automatic hypocenter determination method using Bayesian estimation (Tamaribuchi et al., 2016) reads these data and automatically creates a subset of arrival times which explains candidates of the earthquake location. The location with the highest probability is selected as a hypocenter.

We located about 15000 aftershocks for the 11 months data. The catalog was refined using a joint hypocenter determination technique (VELEST), and an optimal one-dimensional (1D) velocity model and station correction factors were determined simultaneously.

Our catalog showed that there are two large aftershock clusters along the north side of the Gorkha--Pokhara anticlinorium (GPA) and smaller shallow aftershock clusters in the south. The southern clusters are shallower than those of the northern clusters, which is consistent with the dip direction of the MHT. Most aftershocks are confined between the ground surface and the MHT shear zone, and the bottom of the aftershock distribution is consistent with the 3D MHT model. This may suggest a larger stress accumulation on the ramp structures. Compared with the previous seismicity before the Gorkha earthquake, there was almost no seismicity in the south of GPA. The Gorkha earthquake ruptured the lower edge of the locked MHT, which may have activated the southern clusters.

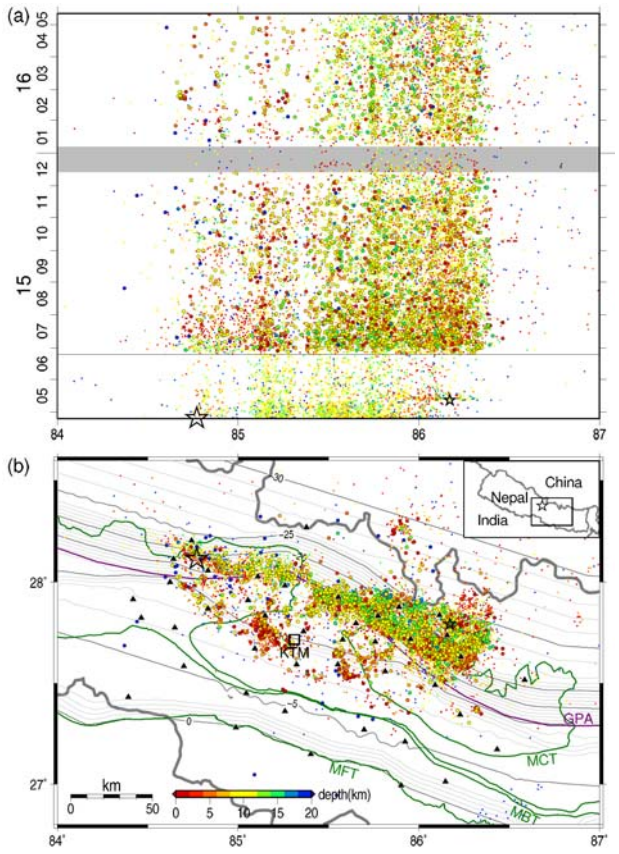


Fig.1 Spatiotemporal variation of the aftershock catalog.