

Lower edge of locked Main Himalayan Thrust unzipped by the 2015 Gorkha earthquake

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Supplementary animation : ‘GorkhaEQ-kimematics.gif’ shows the time evolution of the seismic rupture during the Mw 7.8 Gorkha earthquake of April 25, 2015 derived from our seismological study. Each frame shows slip (background color shading) occurring within a 3 s window indicated by a grey band over the source time function in the inset. The high-frequency sources imaged by back-projection up to the snapshot time (dots, colored by their rupture time) are also plotted up to the frame time.

Table S1: 1D velocity model in the source region.

Vp(km/s)	Vs(km/s)	Density(g/cm ³)	Thickness (km)
5.50	3.20	2.53	4.0
5.85	3.40	2.64	12.0
6.00	3.50	2.69	4.00
6.45	3.70	2.83	6.50
6.65	3.85	2.90	10.00
7.20	4.15	3.07	5.00
7.50	4.20	3.17	14.00
7.90	4.30	3.30	15.00

Figure S1: Station distribution of the Australian seismic network. Yellow triangles indicate the stations used in the high frequency back-projection analysis. (file: ‘FigureS1.pdf’; 8 Mb)

Figure S2: Seismograms (0.5 - 2 Hz) of the Gorkha earthquake recorded by the Australian seismic network. The direct P-wave arrival is aligned at time zero. The station index is ordered by epicentral distance. (file: ‘FigureS2.pdf’; 221 kb)

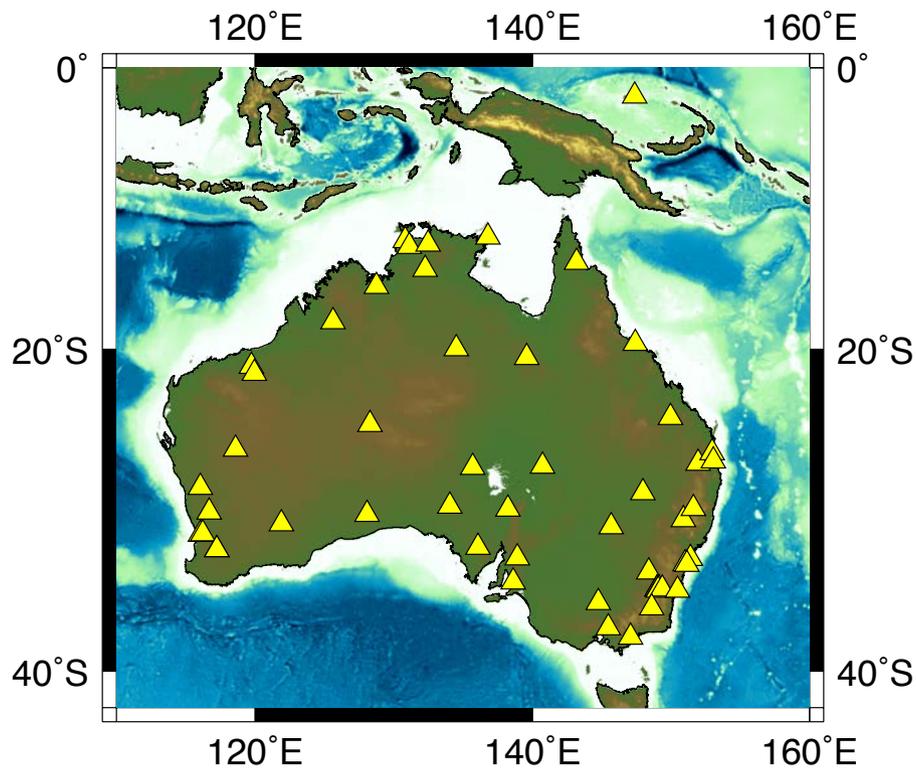
Figure S3: Comparison between the predicted and observed surface displacements derived from cross-correlation of descending (P19) and ascending (P85) images. (file: ‘FigureS3.pdf’; 1.2 Mb)

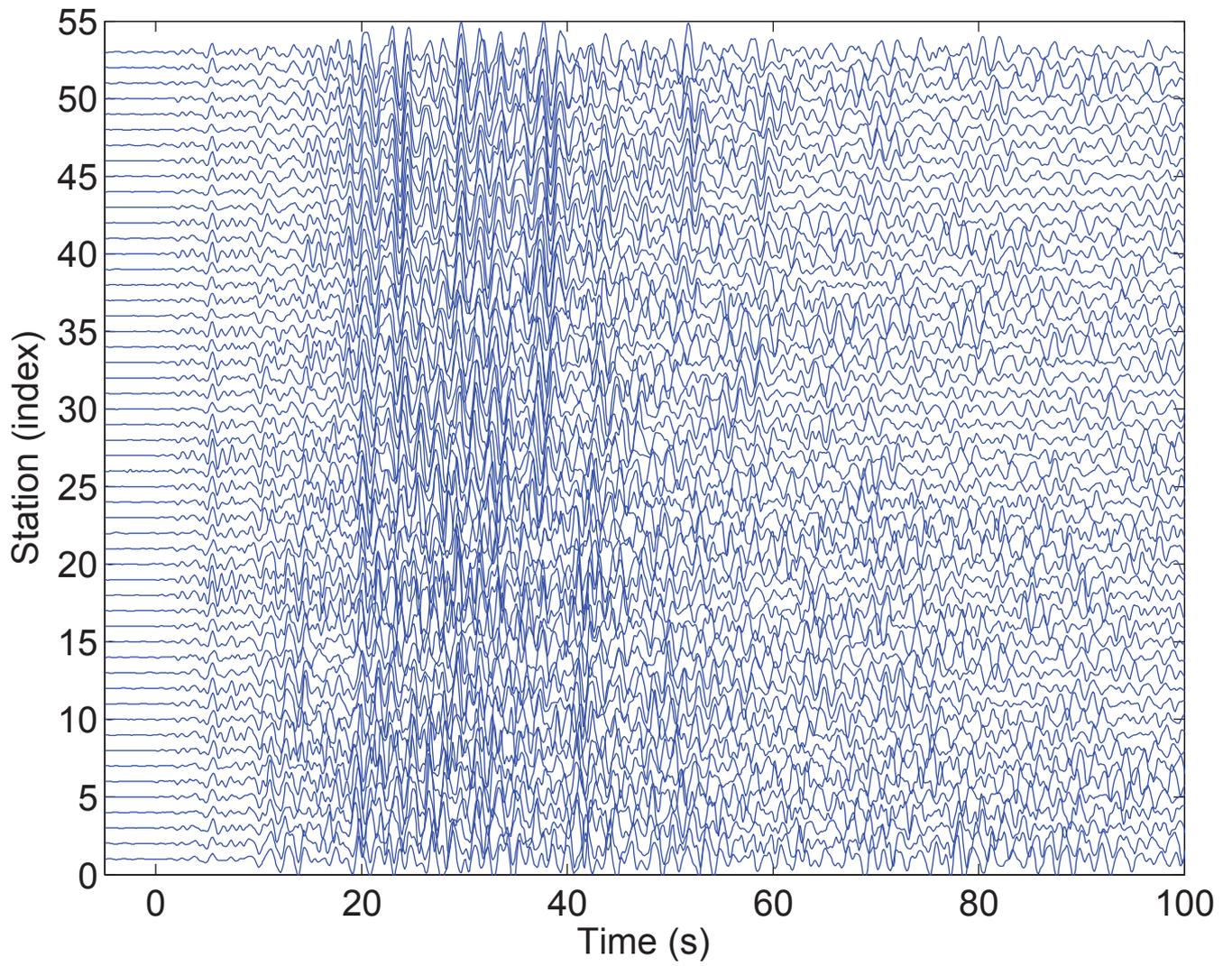
Figure S4 : Comparison between measured (black) and synthetic (red) teleseismic waveforms on the selected stations with P-waves shown on the left and SH-waves on the right (time in seconds). Stations names are shown on the left of each waveform comparison along with azimuth (upper) and epicenter distance (lower) in degree. Stations are arranged such that the azimuth increases from bottom to the top. Note that the SH-waves are much broader in the

direction away from the rupture than that towards the rupture, as indicated by the red arrows. (file: 'FigureS4.pdf'; 1.2 Mb)

Figure S5: Misfit between observed and synthetic waveforms for models with imposed constant rupture velocity. (file: 'FigureS5.pdf'; 1.2 Mb)

Figure S6: Top: Slip distribution in depth view, arrows indicate the rake angle and the slip amplitude is color coded. Rupture times are indicated by the contours. Bottom: Rise time distribution in depth view, only shows the slip patches with slip amplitude larger than 1 m. (file: 'FigureS6.pdf'; 1.2 Mb)





P19: azimuth

P19: range

P85: azimuth

P85: range

