ID: Type: **Oral**

Earthquake swarms and reactivation of seismicity associated with the 2015 Mw 7.8 Gorkha earthquake in Nepal

Wednesday 26 June 2019 11:15 (15 minutes)

The earthquake activity of central Himalayas is monitored continuously since 1994 by the national seismic network of Nepal (NSC) comprising 21 seismic stations. Most of the recorded seismicity nucleates along the downdip-end of the locked fault segments of the Main Himalayan Thrust fault, the shallow dipping mega-thrust between Indian plate and Tibetan Plateau. After the April 25, 2015, Gorkha earthquake, more than 40,000 events were located within the study area and there were 30462 events with ML >= 2.3, including 7 events with ML >= 6.0, and one large aftershock with Mw 7.3 on May 12, 2015. There is no clear evidence of foreshocks or other pre-seismic patterns. In 2018, the seismicity rate in the ruptured area is still about 5 times higher than the background seismicity before the Gorkha Earthquake. The Gorkha earthquake is the first large Himalayan earthquake allowing a detailed analysis of its aftershocks and the associated relaxation processes. Several global reactivations and anomalous bursts of earthquakes, sometimes organized in clusters. Some of these clusters are located outside the rupture zone either in Nepal or on Tibetan. Most of them appear to be controlled by geological structural complexities of the Main Himalayan Thrust fault.

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Session Classification: T1.2 Solid Earth Structure

Track Classification: Theme 1. The Earth as a Complex System