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Successive 1697-1950 great earthquake surface ruptures in the eastern Himalayan front

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Spatiotemporal distribution of Himalayan seismic events are yet to be fully constrained, despite the reports of surface signatures of great earthquakes considered to have occurred on blind faults exist. Challenging this paradox, we report here first evidence of the 1697 and 1950 great earthquake surface ruptures that were hitherto considered to have occurred on blind faults. Paleoseismic trenches across young fault scarps at Pasighat and Nigluk villages along the mountain front of eastern syntaxis with multi-proxy radiometric analyses clearly indicate that the 1950 earthquake ruptured the Himalayan front at least between $\sim$95° 10' and $\sim$96° E, producing co-seismic slips of 5$\pm$1 and 3$\pm$1 meters. These earthquakes successively ruptured two adjoining Himalayan frontal segments with a gap of $\sim$253 years. A period of $\sim$1100$\pm$200 years is inferred as the recurrence interval for great earthquakes in the eastern Himalaya. Presence of radiocesium in horizons beneath the 1950 event along with aerosol back trajectory modelling provides the first transcontinental transport of radioactivity from the Hiroshima-Nagasaki atomic bombing to Indian subcontinent.