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Imaging of Main Himalayan Thrust in Central Seismic Gap using seismic interferometry

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The Main Himalayan Thrust (MHT) demarcates the boundary between the underthrusting Indian Plate and the overriding Himalayan orogeny. Stress accumulation on the MHT due to the underthrusting of the Indian Plate leads to the occurrence of bigger earthquakes in the Himalayas. It is, therefore, imperative to understand the MHT's geometry in different Himalayan segments. Furthermore, how this geometry varies along the Himalayan arc while taking into account the uneven distribution of earthquakes offers a comprehensive insight into earthquake nucleation in the region. The central seismic gap is one of the most significant segments of the Himalayas, which is considered a potential region for the proposed great earthquake in the future. This study focuses on defining the MHT geometry by constructing a 3-D model within the central seismic gap using the seismic interferometry technique. We analyzed the data sets obtained from 159 broadband stations spread across the area to construct a comprehensive three-dimensional geometry of MHT. The different arc normal cross-sections highlight variations in the MHT's geometry along the arc in the central seismic gap.

Keywords: Main Himalayan Thrust, seismic interferometry, central seismic gap, crustal imaging.