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The Mw 6.7, 2016, Imphal earthquake and its implications on the seismic hazard along the Indo-Burmese plate

Parameswaran, R.M.¹ and Rajendran, K.¹

¹Centre for Earth Sciences, Indian Institute of Science, Bangalore, India-560012;
revathyparameswraan@ceas.iisc.ernet.in

The 2016, Mw 6.7 Imphal earthquake is one of the largest, instrumentally well-recorded, seismic events to have occurred in the Indo-Burmese plate boundary, where Indian and Eurasian plates converge in a roughly NE direction (~3-4 cm/yr). In the midst of on-going debates of whether the subduction is active, slow, or inactive along this plate boundary, this earthquake provides additional information on the nature of seismic sources and relation to regional tectonics. Results from teleseismic moment inversion of 86 P- and SH-waveforms from 70 global broadband seismic stations suggest right-lateral strike-slip with a slight oblique component, at a source depth of 55 km. Neither the deep crustal source nor the faulting mechanism seems unusual based on previous studies in the region. The moment rate function suggests a simple rupture with a velocity (2.6 km/s) that concurs with intra-slab slip. Analysis of azimuths and plunges of P-axes over planar and cross-sectional profiles reveals a NNE-SSW directed compression, which suggests the dominance of India-Eurasia collision rather than the India-Sunda convergence. Thus, the plate boundary seems to be more prone to intra-plate activity within the subducting Indian slab rather than inter-plate events along the plate boundary. This segment of the India-Eurasia plate boundary, considered as a transfer zone between the Himalaya continental convergence zone in the north and the Andaman- Sumatra subduction zone in the south, has not generated any great earthquakes in the recent history. Behaviour of this important segment needs to be evaluated using well-recorded moderate events as the one discussed here.

