The 2025 Dhaka earthquake: evidence of contortion or tear of Indian plate beneath the Indo-Burmese arc

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A moderate-magnitude earthquake (M_w 5.5) shook central Bangladesh on the morning of 21 November 2025, causing the loss of life of at least 10 people and injury to about 100 people. The earthquake hypocenter is located ~ 20 km northeast of Dhaka, within the Indian plate, beneath 15–20 km thick Bay of Bengal sediments. The focal mechanism of the intraplate earthquake is consistent with the India-Eurasia/Sunda relative plate motion and exhibits reverse motion on the moderately steep plane oriented in the east-west direction. The earthquakes that occur beneath the neighbouring Indo-Burmese arc exhibit quite a large variation in their sense of slip and orientation of the planes, with a majority of them involving sinistral motion on the approximately east-west-oriented steep nodal plane. These planes appear to be aligned with the contortions or tears seen in the Indian plate beneath the Indo-Burmese arc, which have been previously identified based on offsets in seismicity at depth and anisotropy studies. We opine that the east-west oriented planes within the Indian plate, which host intraplate earthquakes, like the 2025 Dhaka earthquake, get reactivated in sinistral motion beneath the Indo-Burmese arc and later cause contortions or tears in the Indian plate at depth.

Keywords: Dhaka earthquake, focal mechanism, intraplate earthquake, Indo-Burmese arc, slab tear.