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comparative study on the tectogenesis of 2015 Mt. Kinabalu Earthquake of Sabah Malaysia and tsunamigenic 2018 Sulawesi Indonesia Earthquake

The 2015 Mount Kinabalu Earthquake of moment magnitude (Mw) 6.0 and focal depth 10 km located 6.014°N 116.563°E in the Kinabalu Mountain of Sabah lasted for about 30 seconds. This earthquake occurred well away from the nearest plate boundary in the region of very low historical seismicity mainly because of the rupture of a northwest-dipping normal fault that did not reach to the surface. However, seismological and morphotectonic evidences suggest that the rupture occurred on a normal fault that splays upwards from the brittle-plastic transition in the interface décollement. Proposed thermo-tectonic model further suggests slow build-up of strain due to the on-going lower crust melt, delamination and sinking of lower crust, spontaneous instability, and sudden sub-crustal collapse. The recurrence time of 2015 Kinabalu Earthquake having magnitudes ≥5, ≥6 and ≥7 has been calculated which is about 20 years, 150 years, and 1300 years respectively. On the otherhand, moment magnitude (Mw) 7.5 Sulawesi Earthquake struck north of Palu, Indonesia on September 28, 2018 that ruptured north-south trending Palu-Koro fault with left-lateral strike-slip motion. Tectonic mechanism here bears character of subduction tectonics. Subducting slab along Minahassa Trench in the Selebes Sea below Sulawesi Island is undergoing partial melting in the upper mantle.

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