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In the Context of EMST Vertical Displacement is the Common Generating Mechanism for Earthquakes and Tsunamis

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In the Excess Mass Stress Tectonics (EMST) conceptual framework an earthquake and/or a tsunami is a series of traveling and standing waves (solitons), generated by an abrupt disturbance that vertically displaces the rock and/or the water column, respectively. When a large area of the sea floor is gradually elevated, due to electron inflow in micro-cracks, and then suddenly subsides, due to electron overflow from the micro-cracks, an earthquake and a tsunami can be generated. As it was dramatically shown by the 26 December 2004, magnitude 9.3 Giant Indian Ocean earthquake and tsunami, and the 8.7 earthquake of 28 March 2005, the greater the elevation and the elevated volume, and its subsequent subsidence, the greater the earthquake and the tsunami will be. The estimate of 1.3×10^{23} N. m of seismic moment, that corresponds to the 9.3 earthquake, and the 140 seconds of its source duration, give a time unit energy requirement in the order of 9.3×10^{20} W. This power could be provided by the sudden collapse, from an average height of ∼2 m, of an ellipsoid rock volume, ∼1600 km × 400 km × 30 km, the area of which (ellipse ∼1600 km × 400 km) is determined by the distribution of aftershocks, and its depth (30 km) by its focal position. This sudden downward displacement of the rock volume produced the sudden downward movement of the water column, which subsequently produced the catastrophic tsunami. At the epicentral area the maximum amplitude of the Sumatra tsunami was about 50 cm, as NASA's Jason and TOPEX/Poseidon oceanography satellites have shown. The estimated seismic moment (1.1×10^{22} N. m) of the 8.7 earthquake was about 12 times lower than the seismic moment of the 9.3 event. All other things being equal, the average collapse height for the 8.7 event should be ∼17 cm, which apparently was not enough to cause a catastrophic tsunami. This is an actual physical process, with actual forces acting on an inseparable unit-quantum of intact high mass, and therefore high inertia, solid rock that, due to the dynamic stress caused by the collapsing overburden rock volume, is forced to behave as an elastic medium for a short period of time. The same dynamic stress can also cause inelastic deformation, namely rupture.