



Global investigation of the tsunamigenic dislocation of the seismic fault

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Seismic tsunamis are produced from the sea floor dislocation (SFD) due to the earthquake rupture. The size of the SFD depends on the earthquake magnitude, depth and mechanism. The seismic moment, Mot , corresponding to the tsunamigenic SFD, is equal to $k \cdot Mo$, where Mo is the entire earthquake moment and k is a coefficient smaller than 1. For a first time, we estimated the coefficient k from published data collected for a set of tsunamigenic earthquakes that occurred in the global ocean from 1990 to 2023. The moment magnitude of these earthquakes ranges from 6.0 to 9.3. No default earthquake mechanism has been adopted. However, all the earthquakes considered are of dip-slip (thrust or normal) or oblique dip-slip types. It has been found that $\log k$ increases linearly with the earthquake moment Mo , which implies that the coefficient k increases exponentially with the Mo . For tsunami earthquakes it was found that k has a value larger than its value in regular tsunamis for the same Mo . These results provide a better understanding of the tsunami generation from earthquakes and may open possibilities for estimating the tsunami magnitude at the source.