

# **The 26 December 2004 Tsunami Source Estimated from Satellite Radar Altimetry and Seismic Waves**

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**ABSTRACT.** The 26 December 2004 Indian Ocean tsunami was the first earthquake tsunami of its magnitude to occur since the advent of both digital seismometry and satellite radar altimetry. Both have independently recorded the event from different physical aspects. The seismic data has then been used to estimate the earthquake fault parameters, and a three-dimensional ocean-general-circulation-model (OGCM) coupled with the fault information has been used to simulate the satellite-observed tsunami waves. Here we show that these two datasets consistently provide the tsunami source using independent methodologies of seismic waveform inversion and ocean modeling. Cross-examining the two independent results confirms that the rise-time function is the most important condition controlling the tsunami strength, while the geometry and the rupture velocity of the tectonic plane determine the spatial patterns of the tsunami.