



ID: O1.3-172

Type: Oral

-phases Recorded by the IMS Hydrophone Network from Tsunamigenic Earthquakes in Indonesia

Indonesia is prone to tsunamis caused by seismic (e.g. submarine earthquakes) and non-seismic events (e.g. volcanic activity). Five massive tsunamigenic earthquakes with very different rupture lengths occurred in different parts of the Sunda–Java Trench from 2004 to 2010. This work investigates T-phases recorded at IMS hydrophone stations HA1 and HA8 triggered by these five earthquakes using DTK-GPMCC available in NDC-in-a-box. In addition to T-phases that provide direct information about the epicenter and rupture length, earlier T-phase arrivals, due to seismic to hydroacoustic coupling far from the epicenter, and later arrivals, due to reflections from islands and seamounts, are identified. Results show that the rupture lengths of the earthquakes varied from approximately 300 to 1300 km leading to signals related to the rupture lasting from 200 to 800 s at the hydrophone stations. The obtained rupture lengths are compared to previous estimations calculated based on seismic data. Overall, results based on IMS hydrophone data provide precise and reliable back-azimuths for determining the earthquake epicenter and rupture length. These findings highlight the potential of utilizing IMS hydrophone data for a rapid rupture length assessment of tsunamigenic earthquakes in the Sunda–Java Trench.

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Session Classification: O1.3 The Oceans and their Properties

Track Classification: Theme 1. The Earth as a Complex System: T1.3 The Oceans and their Properties