



Tsunami hazard related to a flank collapse of Anak Krakatau volcano, Sunda Strait, Indonesia

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Numerical modelling of a rapid, partial destabilization of Anak Krakatau volcano (Indonesia) was performed in order to investigate the tsunami triggered by this event. Anak Krakatau, which is largely built on the steep NE wall of the 1883 Krakatau eruption caldera, is active on its southwest side (towards the 1883 caldera), which makes the edifice quite unstable. A hypothetical 0.280 km³ flank collapse directed southwestwards would trigger an initial wave 43 m in height that would reach Sertung, Panjang and Rakata islands in less than 1 min, with amplitudes from 15 to 30 m. These waves would be potentially dangerous for the many small tourist boats circulating in, and around, the Krakatau archipelago. The waves would then propagate in a radial way from the impact region and across the Sunda Strait, at an average speed of 80-110 km/h. The tsunami would reach the cities located on the western coast of Java (e.g., Merak, Anyer, Carita.) 35 to 45 min after the onset of collapse, with a maximum amplitude from 2.3 m (Carita) to 3.6 m (Panimbang). Since many industrial and tourist infrastructures are located close to the sea and at altitudes of < 10m, these waves present a non-negligible risk. Due to numerous reflections inside the Krakatau archipelago, the waves would even affect Bandar Lampung (Sumatra, ~900,000 inhabitants) after ~1 h, with a maximum amplitude of 1.5 m. However, the waves produced would be far smaller than those produced during the 1883 Krakatau eruption (~15 m) and a rapid detection of the collapse by the volcano observatory together with an efficient alert system on the coast would possibly prevent this hypothetical event from being deadly.