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Numerical modeling of the December 22, 2018 Anak Krakatau landslide and the following tsunami in Sunda Strait, Indonesia

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On 22 December 2018, a deadly tsunami occurred in the Sunda Strait, Indonesia, killing more than 400 people and destroying the coasts in several villages in the strait. It was caused by the collapse of a part of the southwestern flank of the Anak Krakatau volcano. Preliminary investigations indicate that it was probably caused by the collapse of a part of the southwestern flank of the Anak Krakatau volcano. This active volcano is being built in the Sunda Straits since the 1920s in a very active volcanic environment of a subduction context, where the cataclysmic explosion of the Krakatau took place in 1883. The latter produced a huge tsunami about 30 m high in the straits, also observed at distance, for instance in La Réunion island where tsunami waves reached a few meters (Sahal et al., 2011).

Such tsunamis cannot be easily managed by warning systems, since they do not follow a detectable earthquake. Numerical modeling helps to better understand their physical processes and the available observations. The 2018 landslide and the following tsunami are simulated here with a unique three-phase depth-integrated code, considering the slide as a granular flow under gravity forces and using the Boussinesq model for the water wave propagation. Preliminary results (arrival times, period and amplitude) are compared with the different tide gauges of the strait, and also with more distant observations, such as the deconvolution of oscillations recorded on a horizontal seismogram located on the Cocos Islands, 1150 km away from the volcano (Okal et al., this session).