

## Numerical simulation of tsunami boulders transported by the 2004 Indian Ocean tsunami at Pakarang cape, Thailand

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Tsunami has huge hydraulic force, and sometimes it may transport large boulders, so-called tsunami boulder, landward from the offshore. Tsunami boulders have been reported at the coastal area of high tsunami-risk countries. These boulders usually have not been removed for a long time. Moreover, their movements could have directly related to the hydraulic force of tsunami. Therefore, field survey and numerical analysis of the tsunami boulder movement may provide us useful information about the hydraulic force of past tsunami.

Although many surveys have been conducted about boulders which might have been transported by past tsunamis, in most cases, there is no strong evidence to prove their tsunami origin. Goto et al. (2007) investigated size and position of boulders, which were transported by the 2004 Indian Ocean tsunami at Pakarang cape, Thailand. This is a first example that detail survey for the tsunami boulder was conducted just after the tsunami event. Therefore, their results are useful to investigate the relationship of the movement of tsunami boulders and the wave properties of tsunami.

In this study, we conducted a numerical simulation of the tsunami boulders transported by the Indian Ocean tsunami in order to clarify the relationship between the distribution of tsunami boulders and the topographical feature of Pakarang cape. In the simulation, we set a maximum boulder at every 200m from the coast to offshore as its initial positions. We use shallow water theory for calculating the inundation of tsunami, and we changed its height and period variously to investigate wave properties that can explain the present position of the tsunami boulder. Based on this simulation, it is clarified that 2.5m height and 30minutes of the wave (incident wave from 100km offshore) can transport the boulder to its present position. We also found that the transport distance of boulder is sensitive to the wave properties of tsunami. Our result indicates that the distribution of tsunami boulders may be useful to estimate the wave properties of past tsunami.