Numerical Simulation of Submarine Landslide Tsunami due to the 1929 Grand Banks Earthquake

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On Nov 18th, 1929, The Grand Banks earthquake (Mw7.2) occurred off the southern coast of Burin Peninsula in Newfoundland, Canada. At the same time and few hours after, twelve Telegraph cables installed on the seafloor were cut, and several meter height tsunami hit the southern coast of Burin Peninsula and 28 people were killed. It is suggested that the earthquake generated the large submarine landslide and turbidity current (Doxsee, 1948; Heezen and Ewing, 1952) and this landslide cut the cables and generated this tsunami. The tsunami waveform was recorded at the tide gauge at Halifax, Canada. We numerically computed this submarine landslide using 'Tsunami squares' cord (Xiao et al., 2015; Yamanaka and Tanioka, 2017; Wang et al., 2019). This cord is a time-dependent landslide model. The area of the landslide is consistent with the previous study (Fine et al., 2005). Tsunami propagation was numerically calculated with JAGURS tsunami simulation code (Baba et al., 2017). As the ocean surface deformation input is calculated from the result of the time-dependent landslide simulation. Mass volume of the landslide is estimated by comparing the calculation result and observed tsunami waveform at Halifax. The result shows that, at least, in terms of arrival time and peak height, the first pulse of the observed tsunami is explained well by the computed one. The amount of landslide is estimated to be about 100 cubic km.

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