

Detection of tsunami deposits in the east of Taiwan using Ground Penetrating Radar

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Tsunami deposits are the indicator to show when and how the areas were inundated by paleo-tsunamis. Recently, investigation of the tsunami deposit has been made progress in east coast area of Taiwan (Ota, 2013; Lallemand et al., 2015). Distribution of the tsunami deposit informs the timing, runup, and inundation area of paleo-tsunamis. We employed the Ground Penetrating Radar (GPR) to detect the scatters in the tsunami deposits and revealed the distribution of the tsunami deposits.

The GPR survey was carried out at Chenggong (north of Taitung, east coast of the Taiwan) from August 18 to 21, 2016.

We surveyed in the middle terrace (asl. 20m) near the Chenggong town. The survey lines were set in the sea side (SS) and mountain side (MS) of the middle terrace. The survey lines in the sea side survey area forms rectangle, short lines are parallel to the shore and long lines are perpendicular to the shore. We surveyed all lines at the radar frequency of 500MHz and 250MHz to compare the subsurface structure by the different frequencies. As a result, we could detect the boundary between the top sediment layer and the basement at the depth of approximately 1m. We could detect the scatters of the radar which were possibly originated to the tsunami deposits in the mountain side of the SS. The scatters were found in the east and west survey lines. We could detect many scatters at the frequency of 250MHz than 500MHz in this area. From the hand-auger survey, we found the coral boulders with the diameter of 10~40cm near the middle point of the survey lines of the mountain side of the SS.

The results suggest that the scatters, which we detected at low frequency range, are distributed densely or buried large boulders. In case of the high frequency GPR survey, we could detect the scatters with a several centimeter size. These imply that size of the pebble or boulders in the tsunami sediments could be estimated using the difference the imaging of the GPR profiles of different radar frequencies.

Keywords: Tsunami Deposits, Taiwan, Ground Penetrating Radar