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Reconstructing the 1771 Great Yaeyama Tsunami Event by using Impact Intensity Analysis and Volume Flux Method

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The event of 1771 Japan Ishigaki Earthquake induced a large tsunami with an 80-meter runup height recorded. Several reef boulders transported by the huge tsunami waves were found along the coast and were located at elevation about 30 meters. Considering the limited distance between Yaeyama and Taiwan Islands, this study aimed to understand the behavior of tsunami propagation and the potential hazard in Taiwan. Reconstructing the 1771 event and validating the result with the field survey is the first step. In order to analysis hazard from the potential tsunami sources around the event area, we adopted the Impact Intensity Analysis (IIA), which had been presented in the EGU 2016 and many other international conferences. Instead of using IIA method, we further developed a new method called the Volume Flux Method (VFM). The VFM kept the accuracy of IIA method. However, the efficiency was improved significantly.

The analyzed results showed that the source of the 1771 Great Yaeyama Tsunami was most likely located at the south offshore of Ishigaki Island. The wave height and inundation area were matched with the survey map (Geospatial Information Authority of Japan, 1994). The tsunami threat to Taiwan was also simulated. It indicated that the tsunami height would not be greater than 1 meters at east coast of Taiwan if the tsunami source located at nearshore around Ishigaki Island. However, it is noteworthy that the northeast coast of Taiwan was under the tsunami threats if the sources located in the south offshore on the Ryukyu Trench. We will present the detailed result in EGU 2017.