

## Estimation for rotation history of tsunami boulders in Hachijo Island, by using viscous remanent magnetization

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In Hachijo Island, there are some huge volcanic-origin tsunamigenic boulders. These are about over 3000kg in weight without any sign of organic carbon, such as fossils. Because such huge boulders are mainly moved by extreme tsunami events, they are paid attentions as a key to understanding of past disaster events. If they are the coral boulders, we can estimate the date of past tsunami by using radiocarbon dating. However, we cannot estimate the date by using this theory for the volcanic boulders without any organic fossils. One of an alternative way to date volcanic boulders is the cosmogenic nuclide exposure dating because it simply accumulates on boulder surface. But, the cosmogenic dating can not apply to the boulders if the boulder had experienced multiple rotations. We applied paleomagnetic approach to these volcanic-origin boulders and tried to examine the age of tsunami event, and rotation history of these boulders. This method is useful for all boulders with a bit of magnetic grains regardless of its lithology, and we can determine multiple rotations. Boulders acquire the secondary magnetic component, called viscous remanent magnetization (VRM) after tsunami. This secondary viscous remanence is acquired to the original magnetic vector after the boulder has been removed from the original state. By using Neel's thermal activation theory, the magnetization at low temperature for a long time can be demagnetized at high temperature in a short time. Thus, we can count backward to the age when VRM was acquired (i.e. the past tsunami event). And we can understand how they emplaced, by displacement of direction of magnetization.

As a result, some samples from these boulders have acquired VRM components. Especialy, andesitic boulder located on 20m above sea level, showed multiple VRM components, suggesting subsequent tsunamis. However, calculated age was older than geological age of Hachijo island. Thus, combination with other dating method such as cosmogenic nuclide dating, is required to verify a gap of tsunami age, and improve accuracy of paleomagnetic dating method.