Estimation of emplaced age of lahar deposits and an attempt to reductive chemical demagnetization with ultrafine bubbles technology

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Lahars are extremely destructive debris flow of mud-rock slurries, sometimes including boulders. The presence of such boulders is well known in lahars worldwide, tracking a potential clue to date the boulders in the deposits using paleomagnetic viscous dating. We now focus on the andesite boulders in Sukawa lahars at the western foot of Adatara volcano, Northeast Japan because 14C dating for wood fragments within these lahar deposits has been already conducted, indicating the occurrence of 18 lahar events during the last 14000 years. However, we found that some boulders are hydrothermally altered in-situ or nearby the crater at the Adatara summit. Such hydrothermally precipitated iron-oxides would lead us to failure during thermal demagnetizations of paleomagnetic viscous dating. Anai et al. (2018) proposed a new reductive chemical demagnetization to dissolve ferric iron (Fe3+) in secondary goethite and pigment hematite precipitated in voids and or cracks in samples using reductive liquid agents of ascorbic acid. Therefore, we preliminary applied their method with ultrafine bubbles technology to our samples for chemical demagnetization, and also applied low-temperature demagnetization to prevent the effect of coarse-grained magnetite. We found that these pre-treatments removed the potential carrier minerals of hydrothermally precipitated iron-oxides along with voids and cracks in our andesites, by dipping the samples in the container with ultrafine bubbles circulation with ascorbic acid hosted in two-layered cylindrical mu-metal magnetic shield in hours. In this presentation, we will show the details.

