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CT imaging plan for Omuro monogenetic scoria cone by cosmic-ray muons

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The internal bulk density structure of active volcanoes has been revealed by muon radiography, which is a tecnology detecting attenuation of cosmic-ray muons passing through materials. From the first significant results by Tanaka et al (2007), researchers observed various active volcanoes in the world.
On the other hand, sometimes interpretation of the imaging result by muon radiography have uncertainty from the view of volcanology, because: 1) the number of muon detectors is not enough to determine the three-dimentional bulk density, 2) most of targets are polygenetic volcanoes.

Concerning to 1), the first stereographic imaging was done by Tanaka et al (2010). Other researchers also applied to put three detectors, but only two or three muon detectors don't have enough information to reconstruct three dimensional density without artificial assumption. If we want to do so, it is necessary to see the object with dozens of detectors like Computed Tomography technology well developed in the medical practice.

Concerning to 2), most of active volcanoes which have risk of damage for human society are polygenetic. Polygenetic volcanoes mainly consists of following three types of monogenetic : lava dome, scoria cone, and maar/tuff ring(it is impossible to apply muon radiography because cosmic-ray muons come from only sky, not underground). For reliable interpretation of polygenetic volcano imaging, we need to accumulate the basic bulk density structure data of monogenetic volcanoes. Nishiyama et al (2016) revealed the three-dimentional decite monogenetic lava dome "Showa-shinzan" in Japan by joint-inversion of muon radiography and gravity measurement. This is a first basic 3D data of monogenetic lava dome. Next we have to get the basic data of scoria cone.

Considering above, we set the next important step, that is CT-imaging of monogenetic scoria cone. No observation data of 3D bulk density structure of scoria cone, especially larger one. This observation will provide the basic 3D data of large scoria cone and also will contribute to the interpretation of polygenetic active volcanoes.