

Detecting interior structure in Iwate volcano using muon radiography.

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Recently, radiography for the internal structure of volcanoes using cosmic ray muons has developed and it has produced results in case of Asama volcano and Satsumaioujima (Tanaka et al.2008). We have setup the muon detector in east foot of the Iwate volcano, about 6km from the summit and detected since October 14, 2016. Besides this, our objective is to understand deep underground water flow system on the interior of the volcano, by performing continuous observation of chemical composition of spring water originating from Iwate volcano. And this results of spring water composition compare to the image of the internal structure of Iwate volcano obtained from muography.

The present data taking is stabilized and simple two dimensional image can be obtained.

However, the density length of volcano body obtained from the measurements shows a value considerably different from the actual thickness of the mountain and it is influenced much by the muons coming in from electromagnetic shower or scattering from the surroundings. On the other hand, a comparison of the actually measured density length and distance from the topographic data used a 10m mesh DEM of volcano altitude and from the density distribution, difference of density distribution appeared from the younger volcano body between the elder.

From the chemical composition of the spring water can be divided to two groups as $\text{Ca}(\text{HCO}_3)_2$ type and the SO_4^{2-} in addition to $\text{Ca}(\text{HCO}_3)_2$. When tritium dating shows values of 13.9-23.5 years were obtained. Particularly for the Oide and Kanazawa springs, the values were respectively 19.4 years and 23.5 years and this indicates the possibility of the groundwater recharged during 1998-2003 eruption crisis to gush out now onwards.

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