

Imaging a lava dome density structure in Unzen

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Introduction

It is significant for the growth model of lava dome which has viscous magma to investigate the density structure in it. The first observation of the imaging a inner density structure in lava dome with cosmic-ray muons was performed by Tanaka et al. (2007) in Showa-shinzan, Japan. The result indicates that the growth model advanced by I. Yokoyama in 2002 is most compatible. The latest lava dome in Mt. Unzen was formed in the eruption from January 1991 to early 1995 and the activity was calmed down in 1995. Nakada et al (1995) observed that the surface of the lava dome was moving from the in endogenous period in Unzen. They proposed a growth model in the endogenous period in Unzen, which is based on their observation and the model includes "peel" structure. According to the dome growth model by Nakada et al, the current density structure in the lava dome should be the following: 1) The ellipsoidal massive part is in the center of lava dome 2) The talus spread around the massive ellipsoidal

The observation and the analysis

In the talus region, there are a lot of air gaps, which makes the clear contrast in the image of density with muon-radiography. The muon detector, nuclear emulsion films which has high position resolution and 0.85m² effective area, was installed in Unzen from early December 2010 to the end of March. . The muons which pass though in the emulsion are detected by the automated emulsion readout system. The readout of the muons and the analysis are going on in Japan and Italy. The progress of the analysis and the preliminary results are shown in this talk.