Oral | Symbol G (General [Education and Outreach]) | General [Education and Outreach]

[G-02_29PM2]Geoscinece Outreach

Convener:*Takeyuki Ueki(Faculty of Risk and Crisis Management, Chiba Institute of Science), Jiro Komori(Teikyo Heisei University), Chair:Akihiko Shibahara(Geological Museum, AIST)
Tue. Apr 29, 2014 4:15 PM - 6:00 PM 423 (4F)
The aims of Outreach and geoscience education are to encourage developments that raise public awareness of geosciences through schools and/or public outreach by not only educators but also researchers. Therefore, any presentation related with these aims will be welcomed to this session. Depending on schedule and venue,some presentation will be changed to Poster presentations.

4:30 PM - 4:45 PM

[G02-P09_PG]An Evaluation of Sieving Effect of Volcanic Ash Fine Particles by A Statistical Particles Image Analysis

3-min talk in an oral session
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Keywords:Volcanic ash, Particle size, Particle shape, Particle image analysis, Sievng

1. Introduction The analysis of particle size and shape characterization is an important evaluation of volcanic ash. It is well known that particles size and shape is one of dominant parameter of volcanic ash for flowability, flying property and abrasively. A sieving is used for particle size analysis of volcanic ash as common method. However, particle has possibility to have shape effect when it goes on through mesh of a sieve. In conventionally, a manual microscope approach has been used for few number of particles shape observation. It is not able to described particle shape as significant number. On the other hand, a fine particle characterization of volcanic ash (less than 50μ m) has also importance to hazard protection issue which is a fine particle has possibility to long duration time in air. Our group has reported particle characterization and classification of a volcanic ash fine particle using by images for the purpose of determining particle size distribution which is based on described in ISO13322. The particles are appropriately dispersed and fixed on an optical microscope implemented a fully automated sample stage and an automated real time particle image analysis function on software. This report will be discussed for effect of sieving and precise classification against volcanic ash fine particle by a statistical particle image analysis.2. Material and method In this study, the volcanic ash was sampling from Ito flow in Kagoshima. This sample was already filtered coarse particles before, and sieved by a analytical sieve (TOKYO SCREEN CO.,LTD), these mesh size were 75μ m, 50μ m, 32μ m. It was passed to 75μ m, 50μ m and only trapped on 32μ m. As a statistical particle image analysis, Morphologi G3-SE (Malvern Instruments) was used for evaluation of particle size and shape. The observation mode was diascopic mode (Transmittance mode) and magnification was 100x in total magnification. The sample was dispersed with SDU (Sample Dispersion Unit) which attached Morphologi G3-SE. Number of measured particles was 120,000 and a parameter filter function on software was used based on shape and pixel number of particle image.3. Result A classification based on sieving were under 32μ m sample (sample 1), over 32μ m sample (sample 2) and no pretreated sample (sample 3). Those samples were analyzed on over 60,000 particles by statistical particle image analysis. As a result, Number Based Circle Equivalent Mean (NCED Mean) was 8.7μ m (sample1), 13.9μ m (sample 2) and 9.6μ m (sample 3) on each. However, 510 particles of over 32μ m particles were detected in sample 1. It was assuming from this result that shape effect happened. Therefore the result of focus on over 32μ m particle to consideration of more precise classifications was shown in Table 1. This result showed sample 1 was the most elongate in the same size

particles. Intensity Mean (IM) is reflected to sample thickness and transparency. High IM particles are tin particles or glass like particles in normally. Therefore, it can possible to classification glass liked particle or non glass like particle in volcanic ash based on IM parameter. According to results, sample 1 was most of including a glass like particle in amount of particles (Table 2, Fig 1).4. Conclusions In summarize of this study, it was clarified particle shape effect against sieving.This report will be more discuss about application and capability of numerical definition of volcanic ash by the statistical particle image analysis as new approach for this research area.