Mitigation of Volcanic disaster - Basic and applied research

Convener:*Kazutaka Mannen(Hot Springs Research Institute of Kanagawa Prefecture), Shinji Takarada(Geological Survey of Japan, National Institute of Advanced Industrial Science and Technology), Eisuke Fujita(National research Institute for Earth science and Disaster prevention, Volcanic research department), Hisashi Sasaki(Asia Air Survey Co., Ltd.), Chair:Yasuo Hattori(Central Research Institute of Electric Power Industry), Kae Tsunematsu(Graduate School of Environmental Studies, Nagoya University) Mon. Apr 28, 2014 11:00 AM - 12:45 PM 416 (4F)

Volcanic disaster is caused by wide range of volcanic phenomena including ash fall, lava flow, pyroclastic flow, debris flow, mud flow and etc. To mitigate volcanic disaster, wide range of technologies such as simulation technology, data processing on GIS, communication technique are required. This session invites talks and broad reviews related to these topics. Talks on database technology, case example of social and school educations, and specific examples of eruption crisis are also encouraged.

12:30 PM - 12:45 PM

Particle fallout from an eruption column (2) - evaluation of reproducibility

3-min talk in an oral session
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One of the major sources of error in tephra fall simulation is considered to be the source term, which depicits amount of particle release as a function of height in eruption column. The source term has been assumed to be linear or modeled using relationship between particle size and plume velocity (Suzuki function); however, no direct observation of the source term has been reported. The author has tried to obtain source term of the 1986 Izu-Oshima B eruption based on inversion technique using a tephra simulation code named Tephra2. Here the reproducibility of the inversion is evaluated. In this study, two methods are applied to evaluate reproducibility. One is validation using a dummy source term. In this method, a dummy source term is given and tephra loads on each observation point is calculated using Tephra2. Based on the calculated loads, the source term is inversely calculated and compared with the originally given source term. The other method is jackknifing. In this method, source terms are calculated using dataset in which a single observation is deleted one by one. The calculated source term is called as pseudo-value and the estimated source term is defined as an average of the pseudo-values. The error of the source term is also defined as a standard deviation of the pseudo-values. In the 1986 Izu-Oshima B eruption, range of reproducible height changes as a function of grain size; 0-7 km for -3 phi particles and 0-4 km for 0 phi particles. The errors of obtained source parameter was limited; less than 10 % in the most cases.