

TITLE: Total grain size distribution of key eruptions in Iceland

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Context

The vulnerability of aircraft to volcanic ash is well known, and the disruption that the dispersal of fine-grained ash can cause was well demonstrated in the 2010 eruption of Eyjafjallajökull volcano (Iceland). The dispersal potential of volcanic ash depends on several factors, including intensity of eruption and plume height, wind direction and wind speed and importantly the characteristics of the ash particles, the grain size distribution, the density and the shape of the particles. A collaborative project with the University of Iceland and the University of Florence is ongoing to better characterize the eruption source parameters of key Icelandic volcanoes in order to better understand volcanism in Iceland and mitigate the associated risk.

Objectives and Methods

Field work will be carried out in Iceland in order to sample key deposits and determine the total grain size distribution (TGSD) and other physical parameters of eruptions at key volcanoes, e.g. Öräfajökull, Askja and Katla. Samples will be analysed based on laser diffraction and manual sieving in order to constrain grain size distribution at individual locations and dedicated models will be used to determine the TGSD. Numerical models will also be used to assess the representativeness of the TGSD based on deposit exposure. A dataset for these key volcanoes will also be produced that includes TGSD, erupted volumes and plume heights. All these parameters are crucial to the forecasting of future eruptions and the mitigation of the associated risk, especially in terms of threats to aviation.

Literature

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- Bonadonna C, Folch A., Loughlin S, Puempel H, (2011) Future developments in modelling and monitoring of volcanic ash clouds: outcomes from the first IAVCEI-WMO workshop on Ash Dispersal Forecast and Civil Aviation (Geneva, Switzerland, 18-20 October 2010), Short Scientific Communication, *Bulletin of Volcanology*
- Janebo MH, Thordarson T, Houghton BF, Bonadonna C, Larsen G, Carey RJ (2016) Dispersal of key subplinian–Plinian tephra from Hekla volcano, Iceland: implications for eruption source parameters, *Bulletin of Volcanology*, 78: 66, doi:10.1007/s00445-016-1059-7



Field work at
Askja volcano,
August 2016

Sites WEB

http://cms.unige.ch/sciences/terre/research/Groups/physical_volcanology/physical%20volcanology.php

Choice of orientation :

Geological Risks