



Cities on Volcanoes 9  
November 20-25, 2016  
Puerto Varas, Chile

*'Understanding volcanoes and society: the key for risk mitigation'*



## Accounting for Aggregation in Operational Dispersion Models

F.M. Beckett <sup>1</sup>, E. Rossi <sup>2</sup>, B.J. Devenish <sup>1</sup>, C. Bonadonna <sup>2</sup>, D.J. Thomson <sup>1</sup>, C.S. Witham <sup>1</sup>

<sup>1</sup>Met Office UK

<sup>2</sup>University of Geneva

Keywords: aggregation, dispersion modelling

Aggregation processes are currently not explicitly modelled in operational dispersion models due to the high computational costs associated with numerical aggregation schemes. An alternative approach is to use a modified particle size distribution (PSD) to initialise the dispersion model which effectively accounts for aggregation. Here we consider the use of a modified PSD which is determined from the application of an aggregation scheme in a buoyant plume model. The aggregation scheme is based on a sectional technique called “fixed pivot”, in which each size range of the PSD is described by a specific Ordinary Differential Equation. The modified PSD is then used to initialise the atmospheric dispersion model NAME, which is used operationally by the London VAAC. We apply this method to model the ash cloud from the eruption of Eyjafjajökull in 2010 and assess its usefulness by comparing the modelled downwind PSD and total column mass loadings of the distal ash cloud to observations.