The Geological Society

# VolcFlow capabilities and potential development for the simulation of lava flows

Karim Kelfoun [1,*] and Silvia Vallejo Vargas[2]

[1] Laboratoire Magmas et Volcans, Université Blaise Pascal–CNRS–IRD, OPGC, 5 rue Kessler, 63038 Clermont-Ferrand, France, [2] Instituto Geofisico, Escuela Politécnica Nacional, Ladrón de Guevara E11-253 y Andalucía, Apartado 2759, Quito, Ecuador

## Abstract

VolcFlow is a finite-difference Eulerian code based on the depth-averaged approach and developed for the simulation of isothermal geophysical flows. Its capability for reproducing lava flows is tested here for the first time. The field example chosen is the 2010 lava flow of Tungurahua volcano (Ecuador), the emplacement of which is tracked by projecting thermal images onto a georeferenced digital topography. Results show that, at least for this case study, the isothermal approach of VolcFlow is able to simulate the velocity of the lava through time, as well as the extent of the solidified lava. However, the good fit between the modelled and the natural flow may be explained by the short emplacement time (c. 20 h) of a thick lava (c. 5 m), which could limit the influence of cooling on the flow dynamics, thus favouring the use of an isothermal rheology.

## Available in:

*Geological Society, London, Special Publications,* 2015, vol. 426, p. SP426. 8.

DOI: 10.1144/SP426.8

http://sp.lyellcollection.org/content/early/2015/06/09/SP426.8.abstract