

Ecole Doctorale des Sciences Fondamentales

Title of the thesis: The dynamics of volcanic debris avalanches

Supervisor : Olivier Roche
Laboratory : Laboratoire Magmas et Volcans
University : Université Clermont Auvergne
Email and Phone : olivier.roche@uca.fr ; 04 73 34 67 68

Possible co-supervisor : Pablo Samaniego
Laboratory : Laboratoire Magmas et Volcans
University : Université Clermont Auvergne

Summary :

The objective of this thesis project is to better understand the mechanisms of debris avalanches that are generated by the rapid gravity collapse of the flanks of volcanic edifices. To date, the mechanisms that control the distance and travel speed of volcanic debris avalanches remain poorly understood, which prevents the scientific community from precisely defining the hazards represented by these destructive phenomena.

The project has two components: a granulometric analysis of the debris avalanche deposit of the Tutupaca volcano (Peru), and an experimental laboratory study. Fieldwork will provide insight into the variations in grain size in different parts of the deposit. The grain size data will be used to do experiment on granular flows analogous to debris avalanches. The main objective will be to study the effect of polydispersity (particle size range) on the flow dynamics.