



The physics of magma ascent in volcanic conduits: a proposal for a model intercomparison and sensitivity study

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In the past decades, important advances have been made in the numerical modeling of magma ascent through the Earth's crust in volcanic conduits. Numerical models allow a better understanding of volcanic conduits and related processes and, for this reason, they are of paramount importance for improving eruption forecasting, volcanic hazard assessment, and risk mitigation.

Despite that, the only effort to bring together the community of researchers developing and applying numerical models of volcanic conduits in an intercomparison study dates back to 15 years ago, when the 2002 Volcanic Conduit and Eruption Modeling workshop was held to establish a standardized set of numerical experiments and eventually led to the publication of a special volume.

Since then, a lot of progress has been done in the numerical modeling of magma ascent, highlighting the importance of previously neglected processes such as gas-magma decoupling, disequilibrium degassing and crystallization, local temperature variations, viscous heating, 2D/3D effects.

In this presentation, we will review the present state of conduit processes numerical modeling and we will propose to the community a standard set of input parameters and numerical experiments, with the ultimate aim to launch a new intercomparison of models and a sensitivity study of processes which will help to identify the weakness and the medium/long term objectives to pursue.