

# **In situ identification of falling magma rheological properties**

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## Abstract

It is known that the falling magma on an inclined plane behaves as a Bingham-plastic fluid. Analyzing the existing photos on the Web, especially those from Stromboli volcano eruptions; it is possible to build up a model based on lubrication theory for steady state flow conditions.

Combining the momentum flow with a lumped heat transfer analysis is possibly to obtain the necessary governing equations for identification of magma dynamic viscosity and threshold stress. The numerical applications, based on the Stromboli eruption characteristics, validate the proposed model.