

Lava Analog Materials Interacting with Obstacles

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Lava flows can be a hazard to communities and infrastructure, and most attempts to create barriers to stop lava flows have limited success. Not enough is known about lava flows, especially how topography and obstacles affect lava emplacement. Our experiments use corn syrup and polyethylene glycol as lava analog materials to measure the effect of obstacle shape on the width, length, thickness, and velocity of the flow. The lava analog material is pumped out into a tilted tank and flows towards fixed obstacles. The crustal formation of polyethylene glycol extruded into cold water makes the flow behave differently than the corn syrup, a simple Newtonian fluid. The crust, as well as the levees formed on the side of the flow, affects its path and motion. Our experiments showed that the presence of a crust makes the reaction to obstacles of varying angles less significant than a liquid without a crust. These findings mean that more research about the rate of solidification in lava emplacement and its interaction with topography is needed to improve lava flow prediction models and hazard prevention.