Can earthquakes trigger volcanic eruptions? A stability analysis of equilibrium configuration of a Korteweg fluid as a model for magma transport

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In this paper we make a mathematical conjecture to describe the trigger of a volcanic eruption by the occurrence of an earthquake at large distances. Namely, we perform a linear stability analysis of the equilibrium solution of a Korteweg model for a two-phase fluid modeling a magma transport in a volcanic conduit and we mimic the effect of an earthquake by a plane wave perturbation of the equilibrium magma configuration. Fourier analysis of the disturbances will furnish the wave numbers of unstable modes corresponding to exponential growth of the perturbation and, hence, to the ability of a volcano to erupt.