



## **Is gas percolation during quiescent degassing a source of volcanic tremor?**

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Recent work has highlighted the importance of gas percolation processes in both shallow gas release and in deeper magma storage zones in basaltic systems. Here we examine geochemical and geophysical data collected on Mt. Etna in late 2005 that demonstrate clear positive correlations between SO<sub>2</sub> gas flux rate and volcanic tremor, in the absence of superficial volcanic activity. We propose that gas percolation processes are, at least in part, responsible for the observed volcanic tremor, but the exact mechanism is unclear. At least two processes may be important; modulation in the gas flow may induce rhythmic pressure waves through the Bernoulli effect while opening and closing of the vesicular channels that allow gas transfer may also produce pressure waves. In this work we combine the observed datasets with a model of magma dynamics in the shallow conduit and attempt to highlight the most likely mechanisms that could produce volcanic tremor. Our results will help to constrain future modelling studies.