



The role of seismology in volcanic forecasting

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Seismic monitoring is at the core of any volcanic monitoring program on active and dormant volcanoes alike. The first signs of volcanic unrest after a period of dormancy, as well as subtle changes of volcanic activity during ongoing eruptions can be detected by seismic sensors in a wide range of signal frequencies, and interpreted in terms of underlying processes. It is this direct link between observable and volcanic process, which makes seismic observations a valuable tool for volcanic forecasting.

In this contribution, an updated overview over different volcano-seismic signals and their respective interpretation in terms of different volcanic processes is presented: Volcano-tectonic events are linked to magma-induced stress changes in the volcanic edifice, seismicity due to rock fall is used as a proxy for extrusion rate, and low-frequency earthquake swarms are quantitatively interpreted as ascending magma. It will be demonstrated that the necessary link between (seismic) observation and volcanic process can only be established through carefully modelling of respective volcanic processes, which have to be constrained by many (if not all) observational aspects. Only these types of models are useful as forecasting tools.