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# Multi-parameter monitoring and modelling of volcanic processes

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It is the aim of any volcano monitoring program to link observables like seismicity, ground deformation and gas release to the state of volcanic activity. Using examples from Soufrière Hills volcano, Montserrat, West Indies, it will be demonstrated how a detailed, simultaneous data analysis of seismic and ground deformation data can reveal changes in the volcanic system which are not directly observable. Such an approach utilises spectral methods and cross correlation techniques on the data side complemented by numerical methods to model physical processes in magma and their impact on observables. Modelling results provide synthetic seismograms that reflect the changes in magma gas content and pressure, which can then be compared to data characteristics derived from observations.