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From seismograms to magma: Interpreting broadband seismic signals in terms of magmatic processes

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Broadband seismic signals are routinely recorded on active volcanoes and classified as, e.g. ultra-long-period, low-frequency, volcano tectonic, long-period rockfall, and explosion event. For certain seismic event types a general consensus exists amongst volcanologists as to the interpretation in terms of the volcanological context, while for other event types the interpretations differ widely. In this contribution we will focus on long-period and ultra-long-period signals and interpret these signals as caused by magma flow in a wider sense. We will summarise different aspects of the signals which need to be satisfied and explained simultaneously. Theses aspects include waveform similarity, repeatability and event rate, accompanying ground deformation, correlation with degassing events, seismic trigger mechanisms, seismic radiation patterns and frequency contents. All these different aspects will be linked to magma flow models, deformation models and synthetic seismograms to arrive at a consistent interpretation.