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Very-long-period seismic signals - filling the gap between deformation and seismicity

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Good broadband seismic sensors are capable to record seismic transients with dominant wavelengths of several tens or even hundreds of seconds. This allows us to generate a multi-component record of seismic volcanic events that are located in between the conventional high to low-frequency seismic spectrum and deformation signals. With a much higher temporal resolution and accuracy than e.g. GPS records, these signals fill the gap between seismicity and deformation studies. In this contribution we will review the non-trivial processing steps necessary to retrieve ground deformation from the original velocity seismogram and explore which role the resulting displacement signals have in the analysis of volcanic events. We use examples from Soufriere Hills volcano in Montserrat, West Indies, to discuss the benefits and shortcomings of such methods regarding new insights into volcanic processes.