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# Controls on upper edifice rheology and consequences for seismicity-deformation relationship on volcanoes

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The precise inter-relationships between seismicity and deformation on volcanoes are poorly understood. This is particularly true for shallow seismicity where a variety of seismic signals such as tremor, Long Period and Very Long Period events are observed. For tectonic earthquakes of sufficient size, the static and dynamic components of the sources can be inverted jointly to give a 'broad band' image of the dislocation surface. Despite their shallow nature, this is not currently achievable for individual volcano seismicity events due to their small size and possible sub-resolution (InSAR, GPS) static displacements, if such displacements exist. This hampers our understanding of the true nature of volcano seismicity as we only have access to a band-limited view of the source. In this presentation we introduce new findings which suggest that shallow volcano-seismicity sources may often be quasi-brittle (and hence deformation related) and consequently, in theory, should have a static displacement component. We estimate the expected sizes of these displacements and explore methods that will enable us to detect them. We will also introduce more general observations on the rheology of the upper edifice and the associated consequences for joint seismicity and deformation studies on volcanoes