



## Long Period events: An unreliable indicator of conduit processes?

Chris Bean (1), Louis De Barros (1), Ivan Lokmer (1), Gareth O'Brien (1), and Shane Murphy (2)

(1) Geological Sciences, University College Dublin, Ireland (chris.bean@ucd.ie), (2) School of Environmental Sciences, University of Ulster, Coleraine, N. Ireland

Long Period seismic events are thought to offer a strong indication of a fluid-filled shallow plumbing system and hence are viewed with particular interest on volcanoes. The accepted model for the generation of these events is that of a fluid-filled resonating conduit, although the details of the resonance triggering mechanism are still unknown, though several models have been proposed. Motivated by results from large scale numerical simulations, we have recently made very near-field recordings of LP events at several volcanoes, and in particular conducted a very high resolution experiment at Mt Etna. Results clearly demonstrate the existence of very short duration, pulse-like LP events, which are not consistent with the conduit resonance model. 3D full wavefield numerical simulations in heterogeneous models with DEM topography show that apparent source related resonance is caused by strong path effects, unless the data are recorded within a few hundred metres of the source. An analysis of these pulse-like sources indicates that they are consistent with a brittle fracture model. Although flank recordings of these events look like classical long duration LPs, their short duration at summit stations demonstrates that they are not a reliable indicator of either substantive shallow plumbing systems or sub-surface fluid motion.