Geophysical Research Abstracts
Vol. 14, EGU2012-13368, 2012
EGU General Assembly 2012

The Eyjafjallajökull 2010 eruptions: Correlation study of volcanic tremor and infrasound

K. Jonsdottir (1), C Bean (1), K Vogfjord (2), and M. Ripepe (3)

(1) School of Geological Sciences, University College Dublin, Ireland, (2) The Iceland Meteorological Office, Reykjavik, Iceland, (3) Department of Earth Sciences, University of Florence, Italy

Volcanic far-field seismic tremor recorded at 7-20 km from the Eyjafjallajökull 2010 eruptions is investigated. Over a two months period, two very different eruptions occurred separated by 9 km and two days; an effusive flank eruption and later a highly explosive summit eruption. We observed high amplitude seismic tremor during the explosive eruption while the flank eruption produced very low amplitude tremor. Infrasound data collected for a few days during the summit eruption, as well as other data including plume height is also compared to the seismic tremor amplitude. We find that tremor amplitude does not scale with the plume height. However, in line with similar studies, the infrasound data, characterized by pressure pulses from the volcanic explosions, is seen to correlate temporally (0.55-0.6) with the seismic tremor data, characterized by repeating low frequency events. A high correlation in amplitude (0.8) is also found between these datasets. The analysis reveals a time lag of 15-20 seconds, where seismic low frequency events are seen prior to the infrasound events. This is consistent with co-located seismic tremor and infrasound sources at the eruptive crater, and a surface wave velocity of 1350-1500 m/s. Singlestation three component analyses (undertaken for several stations) of the seismic low frequency events further confirms that they contain Rayleigh wave energy.