Geophysical Research Abstracts
Vol. 18, EGU2016-9366, 2016
EGU General Assembly 2016

Gas emissions and slug dynamics at Stromboli

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We present UV camera data for 200 strombolian and hornito degassing events at Stromboli during June and July 2014. This data was processed to calculate SO_2 masses for each event. In addition to calculating SO_2 masses of the slugs which generate these events we also observe periods of elevated flux following events, termed the gas coda, lasting $\approx$ 30 – 180 s, which we also calculate SO_2masses for. This provided a range of explosive plus coda SO_2 masses of $\approx$ 18 – 225 kg. In combination with 3D fluid numerical simulations of slug flow we begin to probe a possible generation mechanism for the observed gas codas. The simulations show that 'daughter bubbles' are produced from the base of ascending slugs, which result in gas mass loss rates from the slugs of between $\approx$ 1.2 – 14.2 kg s^{-1}. N_f, the dimensionless inverse viscosity number, can be used to characterise the form of a slug wake, and hence when mass loss through daughter bubble production may occur. However, the observed daughter bubble behaviour occurs at lower levels of N_f than predicted by previous mm- to cm-scale studies and suggests that extra physics (e.g. surface tension), beyond that included in N_f, may be needed to parameterise daughter bubble production. We suggest that daughter bubbles could play a role in modulating explosivity of strombolian eruptions as a potential causal mechanism for gas coda production.