



Contrasting but coeval styles of pyroclastic activity at Kamoamoā, Kīlauea, 2011.

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Contrasting patterns of activity along the 2.4.km long Kamoamoā fissure at Kīlauea in 2011 helps to delineate the boundaries between Strombolian explosions and Hawaiian fountaining eruptions. That demarcation has generally been articulated in terms of transient versus sustained activity, in turn, linked to mechanical decoupling versus partial coupling of exsolved volatiles.

The spectrum of activity included both (A) low unsteady fountains, and (B) discrete bubble bursts plus spattering filling much of the area between these extremes. The 5-day-long eruption showed both contrasting eruption styles (A and B) simultaneously from adjacent fissure segments and, at the eastern and western extremities of the fissure, temporal shifts from activity resembling ‘rapid’ Strombolian explosions at Etna (style B) to sustained but low and unsteady Hawaiian fountaining (style A).

Analysis of particle velocimetry and grain size from videos of the activity shows that both styles reflect the ascent of meter-wide large bubbles bursting through the magma free-surface and the contrast in styles is a function of the frequency and size of this large mechanically decoupled bubble population.