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Mapping the Bubble Trap that Feeds Eruptions of Strokkur Geyser, Iceland



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1. Abstract

- Eruptive cycle of Strokkur consists of eruption, conduit refilling, bubble trap gas accumulation and bubble collapses at depth in conduit
- Duration of phases in the eruptive cycle linearly increases from single to sextuple eruptions, except for the conduit refilling phase
- We interpret a 23.7 ± 4.4 m tremor source as bubble trap 13-23 m west of the conduit.
- Only one bubble trap exists & drives single to sextuple eruptions.

2. Instrument Network around Strokkur, Iceland

5. Seismic Tremor Location on 10 June 2018



Eruptions (red dots) and peaks in Phase 4 (orange dots) are marked. Median tremor depth and one standard deviation derived from stations S1–S4.





3. Eruptive Cycle Consists of 4 Phases (P1-P4)



arrow).

- (a) Photos from Phase 1 (P1), 2 (P2) and 3 (P3). Photos in Phase 4 (P4) are similar
- (b) Pressure (black) and temperature (red) measured by the pressure sensor in the



4. Temporal spacing and amplitude of seismic peaks for each eruption type is comparable



(a–f) Spacing between peaks in Phase 3 (gray) and 4 (black), amplitude of peaks in Phase 3 (light green) and 4 (green) for

(a) 129 single eruptions, (b) 144 double eruptions, (c) 109 triple eruptions, (d) 80 quadruple eruptions, (e) all 17 quintuple eruptions, (f) all 1 sextuple eruptions

Vertical gray line marks onset of Phase 3. Colored lines are medians of each dataset.