Supporting Information for

Laboratory Experiments of Forced Plumes in a Density-Stratified Crossflow and Implications for Volcanic Plumes

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Introduction:

Supporting Information consists of three movies and one text file (with 7 figures and 2 tables) that includes the following sections:

- Figure S1: Schematic diagram of the experimental apparatus.
- Figure S2: Density profiles used in the experiments.
- Table S1: Experimental conditions.
- Figure S3: Typical profile of the Richardson number in a volcanic plume.
- Figure S4: Dimensionless volumetric flow rate Q/Q_0 as a function of the dimensionless number W^*/U^* in our experiments.
- Table S2: Source and environmental conditions for historical eruptions.
- Figure S5: Comparison of our experimentally-determined curve with 1D models of a volcanic plume.
- Figure S6: Comparison between the predicted and observed mass discharge rate of historical explosive volcanic eruptions.

- Figure S7: Maximum column height as a function of the source mass discharge rate and wind velocity at the tropopause.

- References: Supplementary references used in Table S2

The movies show three different laboratory experiments:
Movie S1: Time evolution of a weak plume (experiment 24).
Movie S2: Time evolution of a distorted plume (experiment 16).
Movie S3: Time evolution of a strong plume (experiment 29).