

We would like to thank the reviewers and the editor. We addressed their comments in the responses below and revised the manuscript accordingly. Since the reviewers' comments only concerned the figure captions, we revised only those. Their comments are in blue and our responses are in black. We added the bolded sentences.

1. Please spell out “LF” at first use in Figure 14.

Figure 14: Schematic of the main causal chains identified for aerosol-cloud interactions in the Holuhraun and La Soufrière simulations. **LF stands for liquid fraction.**

2. The authors may consider briefly clarifying the differences in Ni between Figures 10f and 11a in the figure captions, which would help readers understand the distinction more easily.

Figure 10:

Spatiotemporally averaged profiles—calculated from 12:00 on April 9, 2021 to 23:00 on April 13—of the number concentration of ash particles (a), the number concentration of heterogeneously formed ice crystals (b), maximum supersaturation over ice (c), the number concentration of sulfate (liquid aerosols) (d), the diameter of sulfate particles (e), the number concentration of produced ice crystals **before applying the mass conservation check** (f), specific humidity (g), and number concentration of produced ice crystals after applying the mass conservation check (h) in the VOLCANO simulation (red), VOLCANO-NO-ASH simulation (green), and NO-VOLCANO simulation (blue) for La Soufrière. The results shown here are for inside the plume. **Nice shows the number concentration of ice crystals produced directly after the ice nucleation scheme.**

Figure 11:

Spatiotemporally averaged profiles—calculated from 12:00 on April 9, 2021 to 23:00 on April 13—of the number concentration (a) and mass mixing ratio (b) of ice particles in the VOLCANO (red), VOLCANO-NO-ASH simulation (green), and NO-VOLCANO simulation (blue) for La Soufrière. The results shown here are for inside the plume. **Ni represents the resulting ice crystal number concentration after all relevant microphysical and transport processes have been applied.**