Dear Céline,

we revised our manuscript and followed many recommendations of the reviewers. Our changes in the text were triggered by the reviewer comments, in the first part of the manuscript mostly by Reviewer 2 in the second part by questions of Reviewer 1, but also by earlier comments of Reviewer 2. They motivated us to read the text critically with a refreshed view — the long gap helped as well.

Here is a short summary of our changes:

Abstract: We followed Reviewer 2 and rewrote many sentences of the abstract.

Introduction: Reviewer 1 recommended a new figure showing the ash lobes. Reviewer 2 asked to shift a paragraph on ash from Section 3 to the Introduction, plus some words on previous work. We did both and added some words about our own paper Niemeier et al 2009.

Model and Simulations: We added details about the model and changed wording as requested by Reviewer 2. We changed the names of our experiments, which was requested by both reviewers.

Results: We followed many suggestions of Reviewer 2 in Section 3.1 (ash). Comments of Reviewer 1, but also the critical view of Reviewer 2 motivated to change and shorten the text of Section 3.2. We hope the reader can follow the read line more easily now.

Discussion: A paragraph on the differences to Niemeier et al (2009) was added, requested by Reviewer 2. A discussion on SO2 scavenging on ash (Reviewer 1) was added to this section and to the introduction and, we shifted a paragraph from the conclusion into the discussion (Rev1).

Figures: We added a new Figure on ash lobes (Fig 1), added the location of the eruption in Fig 2 and 3, changed the order of the plots with in Fig 11 and change the order of the Figures A1, A2 and, A3 as recommended by Reviewer 1. We realized that the deposition values in Figure 11 (now Figure 12) were not correct. We used a erroneous conversion factor. We corrected this error. Deposition values increased by a constant factor.

Thank you very much. All the best for 2021,

Ulrike