

## ***Interactive comment on “Stratospheric aerosols from the Sarychev volcano eruption in the 2009 Arctic summer” by F. Jégou et al.***

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The paper describes an analysis of the properties and evolution of the volcanic SO<sub>2</sub>/sulfate aerosol plume emitted by the Sarychev volcano in June 2009. The study uses a remarkably comprehensive approach, tying together information from multiple sources including satellite and balloon borne observations and simulations from state-of-the-art atmospheric models. The conclusions drawn with respect to the microphysical properties, the sulfur mass estimation and the transport are well supported by the observations. I recommend that the paper be published in Atmospheric Chemistry and Physics subject to a few minor corrections described below.

Minor comments:

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The word "which" should always be preceded by a comma.

Page 3615, line 27: "spatial extent"

Page 3617, line 7: there is currently a debate on the actual emission altitude of the Nabro volcano (several technical comments on the Bourassa et al. paper appeared in SCIENCE in two months ago).

Page 3617, line 10 to page 3618, line 3: this paragraph seems somewhat redundant to the information given in the abstract, and the detailed descriptions are/should be given in Section 2. I suggest shortening this in the introduction.

Page 3618, lines 19 and 20: delete "of" before the percentages

Page 3619, line 18: "in various directions" instead of "under various directions"

Page 3620, lines 15/16: The way this is written, it is not entirely clear, whether the ozone profile is perturbed, or just the spectroscopic measurements thereof.

Page 3622, lines 18-22: I do not understand why the meteorological conditions should not be identical, if the nudging is done in the same way in both simulations. Please explain.

Page 3623, line 2: write "years"

Page 3624, line 3: "most clearly"

Page 3624, line 11: delete "namely"

Page 3624, line 17: "...at latitudes north of the volcano, ...". And I do not understand what exactly you want to say with the part of the sentence following "..., but ..."

Page 3625, line 7: because your study is really focused on high latitudes, the tropical tropopause is not relevant here. Just focus on what the 380 K means for high and mid-latitudes.

Page 3634, line 25: avoid stacked parentheses, i.e. put COS in commas.

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Figure 3: It may be interesting to add a panel with vertically integrated columns that can be more easily compared to the IASI data in Figure 1.

Figure 5: third line of the caption should be “for the longitudes”

Figures 11 and 12: they are almost impossible to read and should be enlarged.

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