V.V. Gerasimov (Referee)
gvvsnake@mail.ru
24 October 2017

The authors have replied to my first general comment. I am not completely agree with the author's point of view on the role of the Calbuco aerosol plume in the reaching of the record ozone hole size in October 2015, but this is a question of interpretation.

As a whole, the quality of figures and English writing has been improved, but some problems (mostly technical) still remain. I hope that the ACP English editing service will correct the rest of mistakes and misprints. Some examples are presented below. I recommend publication the manuscript in ACP after addressing the following technical comments:

Technical comments:

Page 2, lines 6–7:
The following sentence is meaningless without a comparative adjective: "The aerosol number concentration was ~20 times that observed before and one year after the eruption."
It should be: "The aerosol number concentration was ~20 times **higher than** that observed before and one year after the eruption."

"**S**outhern **H**emisphere" instead of "southern hemisphere" should be used throughout the text of the paper.

There are problems with the *singular* and *plural* numbers of some words in the paper. For example, as the words "aerosol" and "aerosols" are *singular* and *plural*, respectively, it should be either "aerosol affect**s**" or "aerosol**s** affect", but not "aerosol affect" (see, e.g., Page 2, lines 15, 18, 26, etc.).

There is also the problem with the use of the terms "*height*" and "*altitude*" throughout the text and figure captions (see, e.g., Figure 2 and its caption).

Page 3, line 7: "The eruption of ~~the~~ Pinatubo..."

Page 3, lines 24–26:
Instead of
"Three moderate volcanic eruptions are ranked in the top 10 of the most influential events on the stratospheric aerosol burden including ~~during the 2002-2012 period~~:"
Should be
"Three moderate volcanic eruptions **occurred in the 2002-2012 period** are ranked in the top 10 of the most influential events on the stratospheric aerosol burden including:"

The following references additionally introduced in the paper **are absent** in the list of references (at the end of the paper):
Pitari et al. (2016a),
Pitari et al. (2016b),
Solomon et al. (2016),
Ivy et al. (2017).
Note also that References are still not in alphabetical order.

Page 6, line 25:
Instead of
"... from ground to mesosphere, ..."
Should be
"... from **the** ground to mesosphere, ..."

Page 7, lines 21–22:
Instead of
"...estimated to be ± 20 % and ± 60 % at particle concentrations lower than 10^{-1} and 10^{-2} cm^{-3}."

Should be

"...estimated to be ± 20 % and ± 60 % at particle concentrations lower than 10^{-1} and 10^{-2} cm^{-3}, **respectively**."

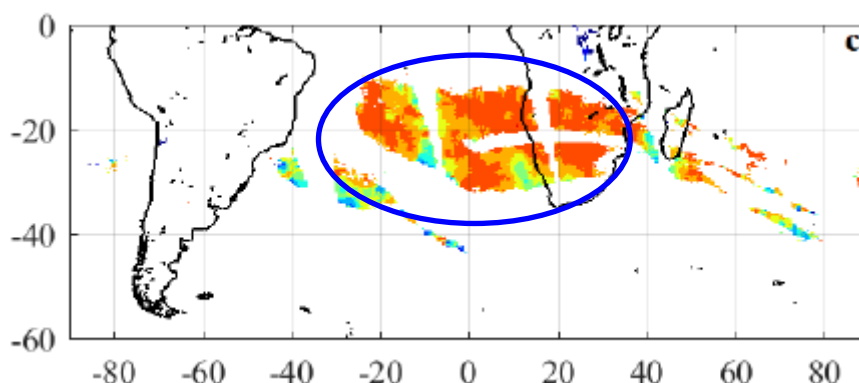
Page 8, line 22: "...launched ~~on~~ **in** October 2011"

Page 9, line 4:
Instead of
"temperaure" (the second *t* is missed)
Should be
"temperature"

Page 10, line 5: "... ~~the~~ Calbuco erupted on ..."

Page 10, lines 17–19: According to the data published by Jegou et al. (2013), this sentence **should be written as**: "The maximum SO_2 total mass (0.41 Tg) emitted during the Calbuco eruption was about two times lower than the maximum value (0.9 Tg) emitted from the Sarychev eruption (0.9 Tg) in June 2009 (Jégou et al., 2013)."

Page 10, line 21: "Figure ~~2~~ **1** also ..."

Page 10, lines 29–30: "On 6 May, the plume is mainly located over the ~~Indian~~ Ocean near the ~~east~~ coast of South Africa and partly over Namibia and South Africa."
According to *Figure 2c (6 May)*, this sentence **should be written as**: " On 6 May, the plume **was** mainly located over the **Atlantic** Ocean near the **west** coast of South Africa and partly over Namibia and South Africa."

Page 10, line 32:
Instead of
"... sulphuric acid which further converted into..."
Should be
"... sulphuric acid which **is** further converted into..."

Page 11, line 16: I understand that SR means the "scattering ratio" here, but this abbreviation (SR) has not been introduced before.

Page 11, lines 20–21: "... when ~~the~~ SO_2 is still being converted (Fig. 1)."
Converted into what? Please, clarify it.

Page 11, line 27:
Instead of
"...corresponds to the period ~~where the~~ SO_2 ..."
Should be
"...corresponds to the period **when** SO_2 ..."

Page 12, line 1: "Figure ~~5d~~ **5b** also ..."

Page 12, line 4:
Instead of
"... the phase of the ~~quasi-biennial oscillation (~~QBO~~)~~ ..."
Should be
"... the phase of the QBO ..."

Page 12, line 14: "... in Figure 5a and ~~5d~~ **5b**..."

Page 14, lines 17–18: "We note that the vertical resolution of OMPS is 10 times lower than the ground-based LiDAR with 0.15 km and 1.5 km respectively (Jaross et al., 2014)."
May be "1.5 km and 0.15 km" instead of "0.15 km and 1.5 km"?

Page 14, line 18:
Instead of
"(Jaross et al., ~~2014~~)"
Should be
"(Jaross et al., **2012**)"

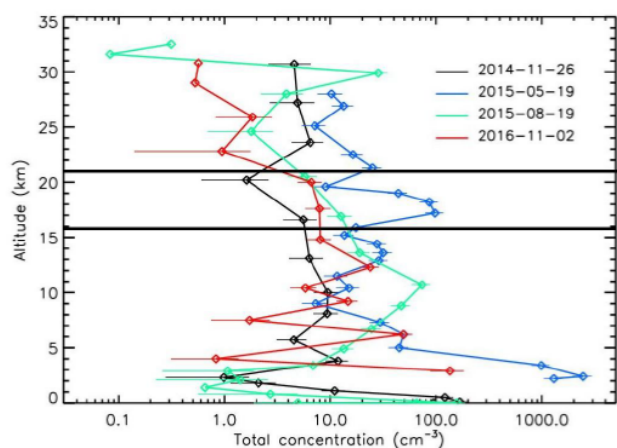
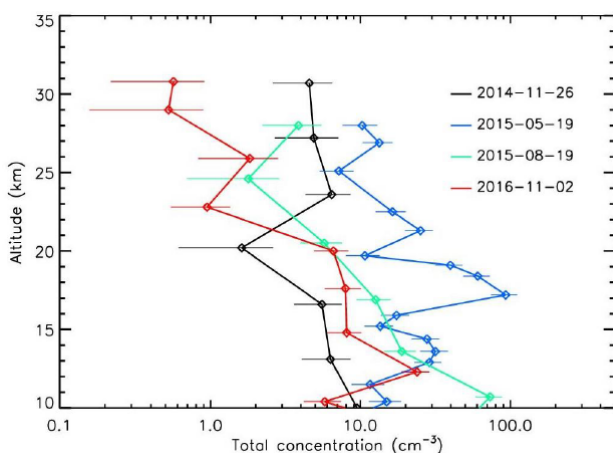
Page 15, line 1: "... solid aerosols such ~~ash~~ **as** ash ..."

Page 16, line 8 and Page 41, line 8:
The description of the particle sizes in Page 16, line 8:
"The integrated number of particles obtained over the full 19 size classes from **0.2 to 2 μm** in diameter is presented in Figure 10."
and the Figure 2 caption:
"**Figure 10**: Total number concentration of aerosols **(0.2-50μm)** profiles obtained from ..."
contradict one another.

Page 34, line 7 (The caption of Figure 3): "...over ~~the~~ South America ..."

Page 41, lines 10–11 (The caption of Figure 10): "The aerosols layer is delimited by two horizontal black lines."
*The mentioned black lines **are absent** in Figure 10.* Please, compare Figure 10 in the Revised paper with Figure 9 in the Discussion paper.

Figure 9 (Discussion paper)

Figure 10 (Revised paper)

Best regards,
V.V. Gerasimov