

## Replies to the Editor

Before publication in ACP there are some minor issues that should be considered as given in the referee report. Additionally, I would like to ask you to consider the following technical corrections

Reply: We thank the editor for appreciating our efforts. We have incorporated the suggestion given by the Editor. The changes are indicated in blue colour at line numbers indicated in the replies below.

P5, L101: is, ....., as a major -> something is wrong here. Please correct. I guess "as" is obsolete.

Reply: It is corrected at L101.

P6, L107: gas-to-aerosol -> gas-to-particle

Reply: It is corrected at L107.

P6, L114: Add a space after full stop.

Reply: It is corrected at L114.

P16, L331: ....the Arctic maximizing during .....-> that maximizes during.....

Reply: It is corrected at L330-331.

P16, L336: twice region -> please rephrase

Reply: It is rephrased as "from the west Asia and Tibetan Plateau region (20 – 35 °N; 60 – 95 °E). This may be due to the transport of sulfate aerosols from India to these regions, which might have been lifted to the UTLS by the post-monsoon convection (see Figs. S1 c, h, k, and S2 c) at L334-337.

P24, L524: "is" obsolete

Reply: It is corrected at L525.

P25, L548: "it" obsolete

Reply: It is corrected at L549.

P25, L550: add "a" so that it reads "for a larger amount".

Reply: It is corrected at L551.

P26, L570: Ind48 simulations show -> The Ind48 simulations shows

Reply: It is corrected at L571.

P27, L588: with sulfate aerosol layer -> with the aerosol sulfate layer

Reply: It is corrected at L588-589.

P28, L600: is inhibited the vertical transport -> please rephrase

Reply: It is rephrased as ‘Reduction of Chinese SO<sub>2</sub> emissions does not stabilize the upper troposphere during monsoon and winter seasons since subsidence over North India inhibited the vertical transport of sulfate aerosols to the UTLS’ at L598-601.

### Replies to the Reviewer-II

Once again, I am encouraged by the effort of the authors. They have extended the study to a whole year, which is more relevant for climate.

Reply: We thank the reviewer for valuable suggestions and appreciating our efforts. We have included suggestions given by the reviewer. The changes are indicated in blue colour in the manuscript and corresponding line numbers are indicated in each of the reply below.

L165: In the authors’ response, the authors mention that the uncertainty they are quoting is based on the 99% confidence interval. But the revised manuscript contains the newly inserted: “significant at 99% level”. Is this related or are the authors trying to express that the trend is positive and significant? If the authors are simply stating the confidence interval (C. I.), the text should read “(99% confidence interval)”. It is fine to state there is an increasing trend that is statistically significant but the reader needs to know what the uncertainty represents. So, if 3.2% is not the 99% C. I., then what is this uncertainty?

Reply: The above sentence is rephrased as ‘99% confidence interval’ at L165.

L477: It should be explicitly stated that the temperature uncertainties in this paragraph are simply obtained by determining the variability within the 10-member ensemble (if I am correctly understanding how the uncertainties were determined).

Reply: It is stated at L479-480.

L1007: back -> black

Reply: It is corrected at L1008.