Response to Reviewers:

The authors greatly appreciate the reviewers' constructive comments to further improve our manuscript's quality. We carefully considered each comment and revised our manuscript to address the issues raised. The original reviewer comments are in black and our replies are in blue. Text excerpts are italicized in *blue* with new text in ***bold***.

Response to **Reviewer #1**

This a very interesting and well-structured paper. It shows the transport pathways of CO from Indonesia to sub-tropical high-altitude locations during two extreme fire pollution events (2006 and 2015) using in-situ and satellite measurements along with MERRA-2 reanalysis products. The topic of this study is interesting and the authors have presented the results with sufficient analyses. The manuscript could be considered to be published in ACP after the following revision.

Reply: We wish to thank the reviewer for their review of our paper and for appreciating the content of the manuscript. We have revised the manuscript while considering the reviewer's comments/suggestions.

I have two major suggestions/comments for the authors

Before Figure 2, in the manuscript, the authors could provide a vertical cross-section of CO over the maritime continent from satellite measurements. This will give a better understanding of CO inter-annual variability and the high CO enhancement in two events, particularly in October 2006 and 2015 compare to other years.

Reply: Thanks for the constructive comment. In the revised manuscript, we have included the above-mentioned plots as Figure 2. These plots show a height-time cross-section of CO observed over the Maritime Continent from January 2003 to 2021 obtained from AIRS (top) and MOPITT (bottom) satellite measurements.

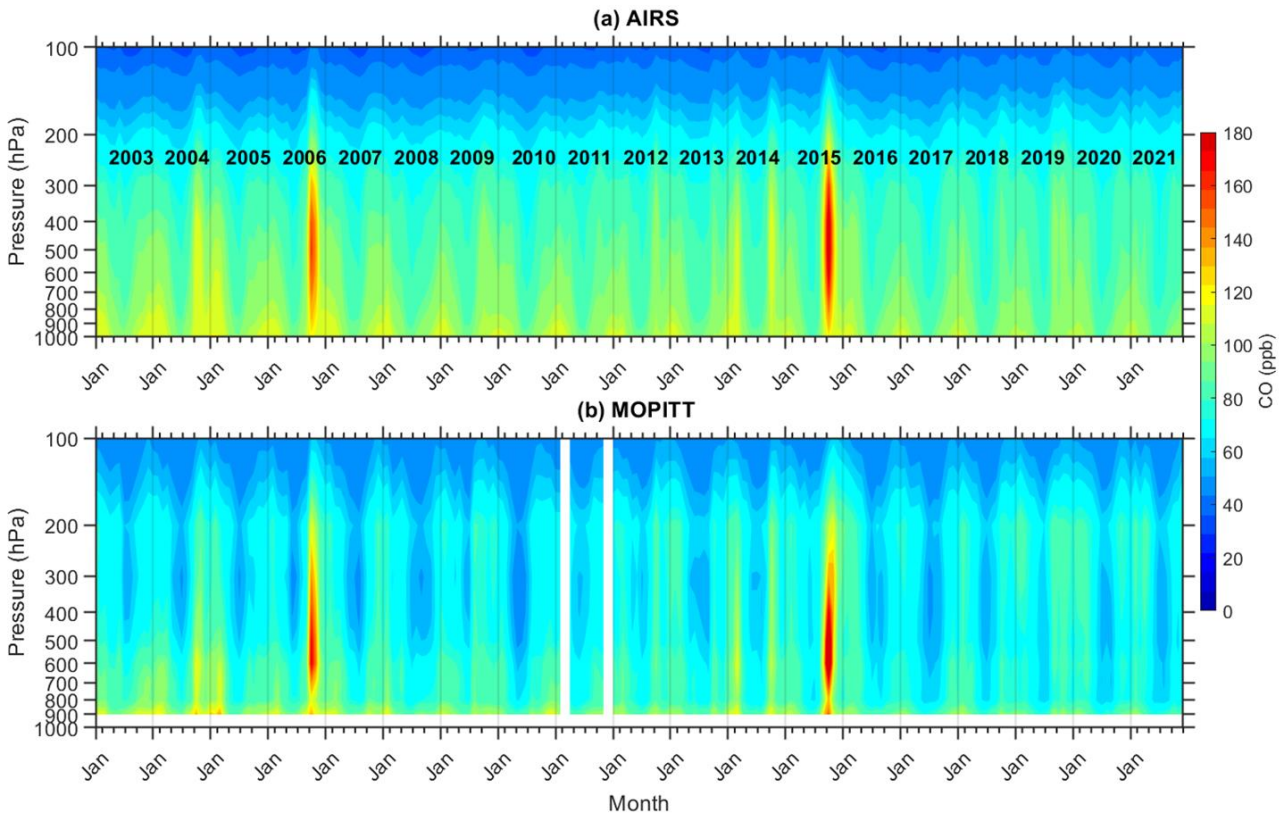
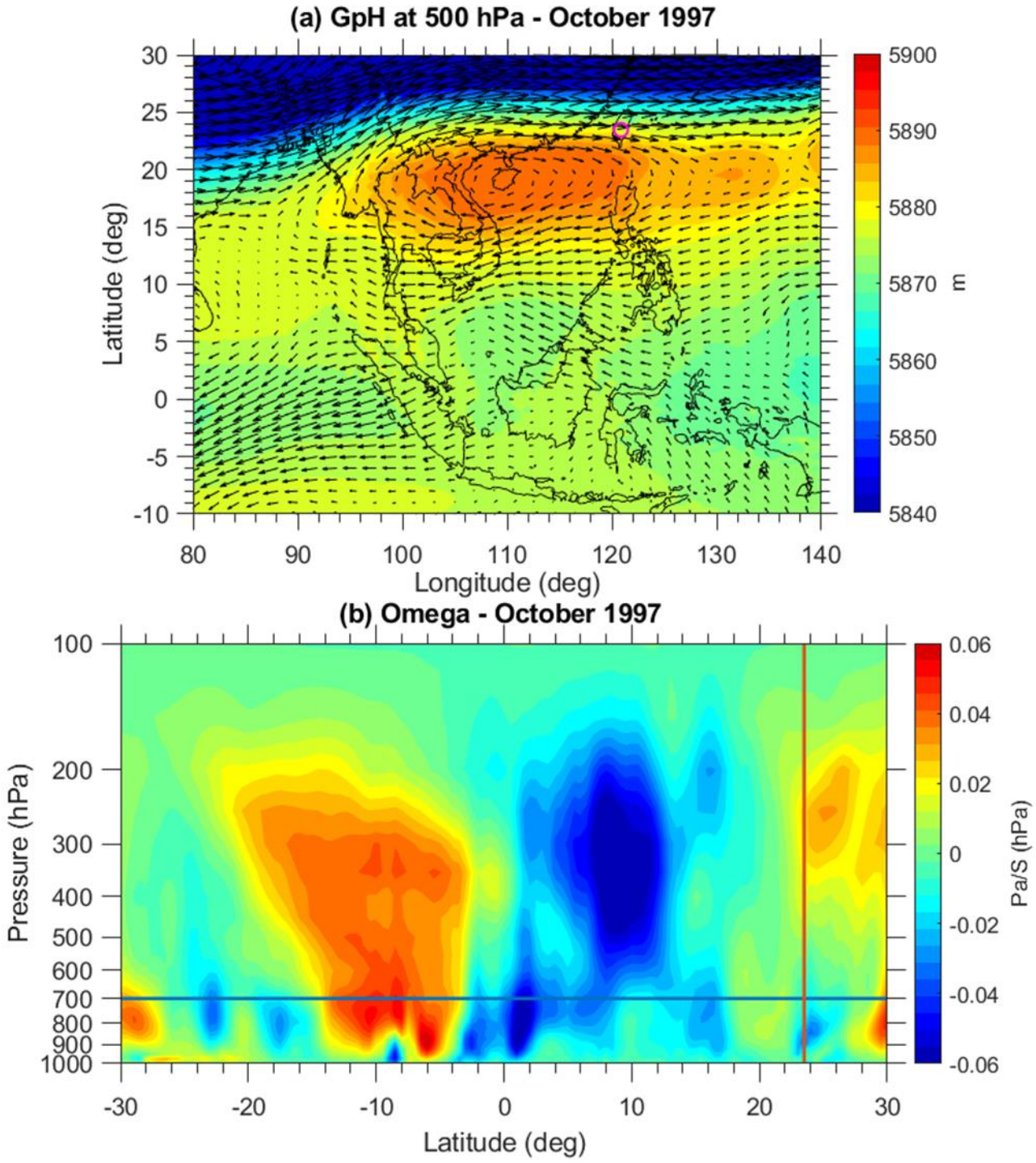


Figure2. Height-time cross-section of CO observed over the Maritime continent (average over 90E-140E,10S-10N) during 2003-2021 obtained from (a) AIRS, and (b) MOPITT satellite measurements.

As mentioned in the introduction by the authors, the 1997 fire event was one of Indonesia's worst fire events. Are there any similarities between 1997 and 2006 and 2015, particularly in large-scale circulations? It would be great if the authors add the large-scale circulations in October 1997, before the conclusions section.

Reply: Thanks for the nice suggestion. We agree with the reviewer that 1997 was an extreme El Niño event and had a strong impact on the global climate. As suggested by the reviewer, we checked the large-scale circulations in the 1997 event by using MERRA-2 reanalysis products and found a quite similar circulation characteristic as noticed in the 2006 and 2015 events. In the revised manuscript, we have included the above-mentioned plots as Sup. Figure4. Please find the below figure.



Sup. Figure4. MERRA-2 reanalysis (a) Monthly mean Geopotential height (GpH) at 500 hPa, and (b) vertical-meridional cross-section of pressure vertical velocity observed on October 1997.