This is a useful study, it's great to see the WRF-Chem interrogated to such an extent. The authors sufficiently addressed the reviewers' comments that I am not inclined to send the manuscript back to them, but I do have some comments I'd like to see addressed before this goes to publication. The following statements refer to the 'tracked changes' document:

Line 41: the statement that anticyclonic conditions occur 80% of the time in July needs more specificity. I see the authors mentioning the Swap and Garstang papers in the response to the reviewers as the source for this information, I'm not sure how those authors described the large-scale flow, but if you are going to go with this, at least include the citation and describe what they say with more detail. But keep in mind that July is the January of the southern hemisphere and such a land-based circulation is not likely to extend very far offshore. I don't see much of an anticyclonic circulation present in the figure 4. Zhang&Zuidema 2021 show above-cloud winds are weak at Ascension in July. Your nice fig. 7 also doesn't show evidence of a land-based anticyclonic circulation, the aerosol is just zonally diffused away from the continent. What would be more straightforward is to just say that there are prevailing if weak easterlies from 850-700hpa that advect aerosol westward. Your figures support that and then you'd be done.

Line 250 in tracked changes: 'against about'? Do you just mean 'about'?

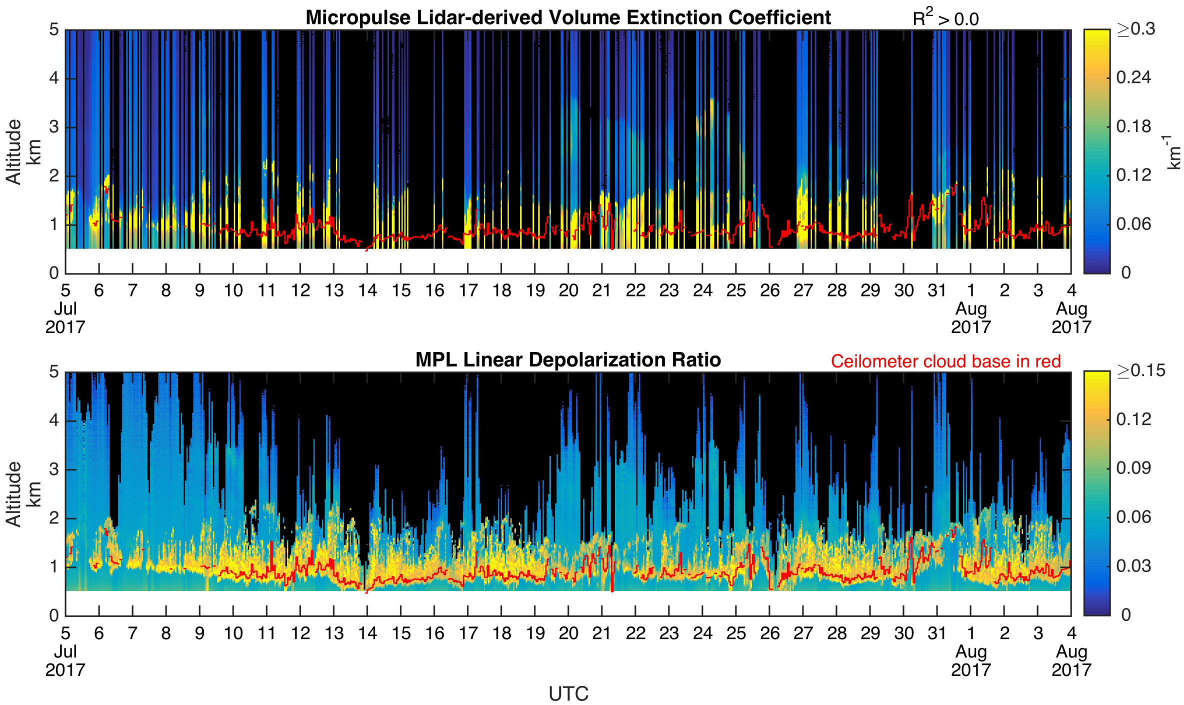
Fig4: wind vectors difficult to see in the top 2 rows, can those be redone to be similar to the bottom two rows.

P.21 last 2 lines: this statement is simply incorrect. There is no anticyclonic circulation, at least not one over land, visible in fig. 4. This is the one I believe the cited papers would be referring to. The altitude of the smoke emission is low enough, especially in the model, that the anticyclonic circulation over the ocean, around the south Atlantic sea level pressure high, would have more of an influence in distributing the aerosol over the ocean than any land circulation. Again I think you can just say here that the winds blow westward off of land north of 20S.

P.25: an injection height of 6km seems high to me, your own caliop data shows the aerosol only extends up to 4km. But the aerosol advected over the ocean in the model is clearly too low. Can the authors comment? Does an injection height of 6km still mean that a lot of the aerosol is placed lower?

p. 28, fig. 9: this is a nice figure. We know that there is plenty of smoke in the boundary layer in July, from the Ascension Island measurements. CALIOP won't be able to discern this, but WRF-Chem might actually be doing better in the boundary layer than this figure would suggest. Would it be possible to show the WRF-Chem extinction from smoke or BC alone? Or alternatively could the authors mention the PC boundary layer smoke mass concentrations somewhere and place them in context with the Ascension Island rBC and, if desired, ACMS measurements of OA?

p. 31, line 715: presumably more of the long-range transport aerosol is in the boundary layer in the model, so the vertically-integrated volume size distribution will contain a larger contribution from the BL. This would suggest the coarse mode aerosol is mostly or entirely sea spray aerosol. Have the authors examined the AERONET data from Ascension? I also include micropulse lidar derived profiles of extinction and the depolarization ratio for July 2016 and 2017, these suggest some dust but it's not much. (extinction retrieved similarly to the AOD-constrained approach of MPLNET; https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2018JD028867). It seems unlikely to me that there is more mass in dust than in sea spray, as stated by the authors on p. 34.



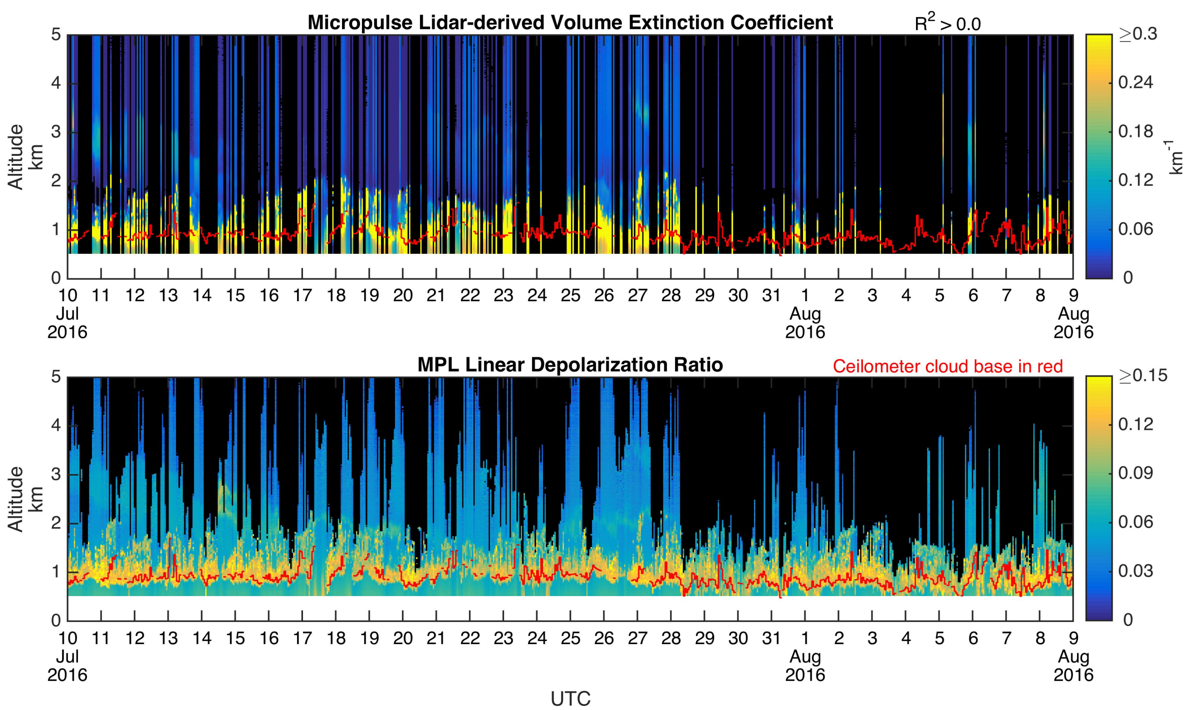


Fig. 12: doesn't seem consistent w ACSM values at Ascension. BC low compared to Z&Z2021.

P. 46 line 944: ORACLES->LASIC

P.50 line 1027: LASIC could also be mentioned here. Some of its data could have been used for this study, although what the authors have done is already interesting.