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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Characterization of Ozone Production in San Antonio, Texas Using Observations of Total Peroxy Radicals" *by* D. C. Anderson et al.

Anonymous Referee #2

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The paper "Characterization of Ozone Production in San Antonio, Texas Using Observations of Total Peroxy Radicals" by Anderson et al. presents observations of total peroxy radicals and supporting measurements at three different sites in San Antonio, TX. The dataset is used to calculate the production rate of ozone and to provide information on the drivers of ozone formation in the area. The manuscript is well written and presented and I recommend after some modifications and clarifications.

Main Comments ————-

The measurements were made at three sites, but most of the discussion seems to be focused on the UTSA site or on aggregated data. The authors do not really use the

dataset to explore the geographical differences between the three sites and what could be the underlying causes of these differences. On page 22 for example it is mentioned almost in passing that the VOC profile at the Floresville site is different (less isoprene). Does that change the main conclusions of the paper? Please add more discussion on the other sites.

The P(O3) values derived from this dataset are lower than those derived from observations in other areas of Texas, namely Houston. It would be interesting to have a more detailed comparison with the other datasets. Only TRAMP2006 is compared with SAFS (on page 22). Especially the TEXAQS 2006 data (Sommariva et al, 2011) which were obtained with a similar technique could be interesting to compare. Are the differences simply a matter of different VOC emissions? In addition, can you comment on the source of isoprene? If isoprene is dominant at the UTSA site but not at the other sites, do the conclusions of the study regarding NOx-limited conditions in the city still apply?

Figure 7 indicates that most of the time O3 production is NOx-limited, but that there are periods, mostly in the morning, when it is VOC-limited. The text related to figure 6 (on page 16) seems to suggest that VOC limited conditions correspond to periods with low P(ROx). However this is not clear from the discussion. If this is the case, than it should be stated explicitly. On page 21 it is mentioned that the VOC limited periods in the morning correspond to high NOx (presumably rush hour emissions?) but the "flat" part of the blue curve in figure 6 is at intermediate NO levels (200-400 ppt). Are you talking about different sites? Please clarify.

Minor Comments ————

It would be good to check the sensitivity of equation 2 to the choice of k_eff. Do the cresults change significantly with another value of k_eff?

Shouldn't O1D quenching by O2 be included in equation 3?

Figure 2. Can you add the outline of San Antonio on the left panel? Is the Floresville site visible on the right panel? And can you use consistent labels? The UTSA site is labelled 1 in one panel and B in the other.

Figure 5. I assume that is the median of all three sites together?

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