Comment on acp-2021-143

Anonymous Referee #3

Referee comment on "The spatiotemporal relationship between PM2.5 and AOD in China: Influencing factors and Implications for satellite PM2.5 estimations by MAIAC AOD" by Qingqing He et al., Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2021-143-RC3, 2021

The authors investigated the spatiotemporal relationship between ground-level PM2.5 measurements and satellite derived AOD data over China for the year of 2019. Compared with previous research with similar topic, this study used high-spatial-resolution AOD data with combination of AERONET data which provide high-temporal-resolution aerosol data, which is important for understanding the relationship of PM2.5-AOD and useful for ground-level PM2.5 estimation, especially when deriving PM2.5 from satellite remote sensing data is becomes more popular. The findings of this study are worth of publication in the journal after minor revision as followings:

- My major concern is the way that you matched PM2.5 and AOD in space, that is：what is the radius of buffer zone around the site for AOD average? please clarify it in detail.
- Line 39-44: A long sentence. Please rewrite it.
- Line 108: It seems no Fig. A1 in supporting document. May be Fig. S1?
- Line 125-128: Please clarify which level of AERONET data were used in this study.
- 1 and 2: Please explicitly describe the two equations. What is the meaning for each variable?
- Line 344: "pollutant acumination"? May be "accumulation".
- Table 1: Why there is no value for NTS in winter?
- Figure 2: the text of "hour" legend is a little small.
- In figure 5, suggest that the count is replaced by frequency, which can be easily compared among different regions, due to their different samples.
- Figure 6: The text for latitude and longitude is a little small. Please replot it.
- Figure S9: it should be "elevation"?