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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Investigation of CATS aerosol products and application toward global diurnal variation of aerosols" *by* Logan Lee et al.

Anonymous Referee #1

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The manuscript named "Investigation of CATS aerosol products and application toward global diurnal variation of aerosols" by Lee et al. presents an intercomparison of the measurements of aerosol optical depth and mean profiles between CATS and other remote sensing sensors (AERONET, MODIS, and CALIOP) for a period of Feb. 2015 - Oct. 2017. This paper also discusses the aerosol diurnal variation patterns changing with different seasons and geographic regions. This manuscript presents an original data analysis of some significant instruments. The discussion and conclusions are sound and clear. Therefore, I recommend for publish after addressing some minor concerns.

Specific comments: Section 2, can you briefly describe the AOD measurement uncertainty of these instrument? P6, L134, it may be better to replace "increasing" with

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Discussion paper

"degrading". P8, L163, can you describe what constant value of that Angstrom exponent is used here without letting readers to look for that in Shi et al. paper? P12, L266-268, "A clear diurnal variation is found, with the peak mean AOD of 0.08 found around local noon and smaller AOD values of 0.06 found for both sunrise and sunset times." In Figure 4, look to me the AOD peak is located around 9AM local time, "before" the noon. Also, is this diurnal variation consistent with your expectation? Can you provide an explanation on why the AOD measured by CATS less than all other instruments suggested by Figure 1, 2, and 3?

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