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The Editor
Atmospheric Chemistry and Physics
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Dear Editor,

We have submitted a revised paper entitled “Understanding day-night differences in dust aerosols over the dust belt of North Africa, the Middle East, and Asia” by J. Z. Tindan, Q. Jin, and B. Pu for consideration for *Atmospheric Chemistry and Physics*. The helpful and constructive comments from two the anonymous reviewers are deeply appreciated. Our replies to each reviewer’s comments are attached. We mainly made the following changes:

- Following the comments from Reviewer #2, more precise IASI overpass time from level 2 data is used in our analysis. Correspondingly, we revised our method to collocate IASI DOD and AERONET CAOD for data validation. Now AERONET station data are sampled within ± 30 minutes of IASI overpass time, while IASI pixels are averaged within a 30 km radius of the AERONET stations. Reanalysis variables are resampled at each grid point based on IASI overpass time, so that meteorological variables are at the same time as IASI retrievals to facilitate comparison. All the related figures and text are updated.
- We refined our selection of AERONET sites. Now 46 solar sites and 11 lunar sites are used to evaluate IASI daytime and nighttime DOD, and nine stations are used to examine the day-night differences in CAOD.
- We now apply a uniform infrared to visible bands (IR/VIS) conversion ratio, 0.6, to convert IASI 10 μm DOD to its 500nm equivalent for both data validation and analysis, following the suggestion of Reviewer #2.
- We have performed additional analysis of wind speed and precipitation at 3 and 6 hours before IASI overpass time to determine whether these variables at previous times have impact on the distribution of DOD at IASI overpass time.

- Following the comments from Reviewer #2, we emphasize that we used IASI DOD and dust layer height retrieved by Laboratoire de Météorologie Dynamique (LMD) in this study. The reasons to use LMD IASI products are also discussed.
- following the suggestion of Reviewer #2, we added some discussion about the uncertainties associated with station data and the potential problems in comparing different products from different observational platforms.

We also made some minor edits to improve the clarity of the paper.

Thank you again for your time and consideration! We are looking forward to hearing from you.

Sincerely,

Jacob Zora-Oni Tindan, Qinjian Jin, and Bing Pu