

## ***Interactive comment on “Two decades of satellite observations of AOD over mainland China” by Gerrit de Leeuw et al.***

**Gerrit de Leeuw et al.**

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Dear Xue Wu,

Thanks for your very quick comments, which help clarify what we did also to other readers. Please find the responses below.

1. Are the day-time and night-time data of CALIOP all used in this study?

Both daytime and nighttime CALIOP observations have been included in the analysis.

2. Did you consider the cloud aerosol discrimination (CAD) score of the aerosol extinction coefficients data? If so, what criteria did you apply to select the aerosol extinction coefficients?

The Winker et al. (2013) procedure and filtering criteria are followed. Specifically, regarding the CAD score, the methodology of CALIPSO L3 for ensuring the use of only cloud-free profiles is applied. According to this methodology only features having a CAD score between -100 and -20 are used. Profiles which do not fulfil the L3 CALIPSO CAD score criteria are filtered. We have followed the quality control procedures and filters described in the literature (Winker et al., 2013; Marinou et al., 2017).

3. What is the vertical range (lower troposphere? Upper troposphere? Lower stratosphere? Or any other?) that you have considered when calculating the AOD, e.g., in Fig.5 ?

The CALIPSO profiles of vertical extinction coefficient at 532 nm with 5 km horizontal resolution are used to calculate the AOD in 1x1 deg<sup>2</sup> horizontal resolution (Winker et al., 2013; Amiridis et al., 2013). CALIPSO L2 profiles are initially horizontally averaged and then vertically integrated between the surface level and the lower stratosphere (~30km height).

Best regards, Gerrit, Manolis and co-authors

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Discussion paper

