



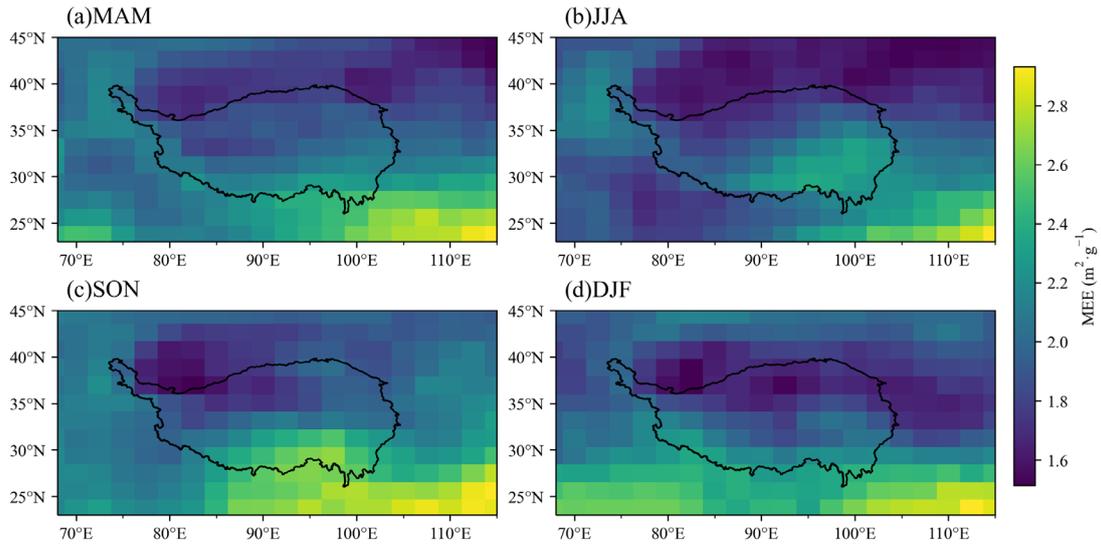
*Supplement of*

## **Diurnal and Seasonal Variations of Dust Transport around the Tibetan Plateau: Insights from Multi-Source Observations**

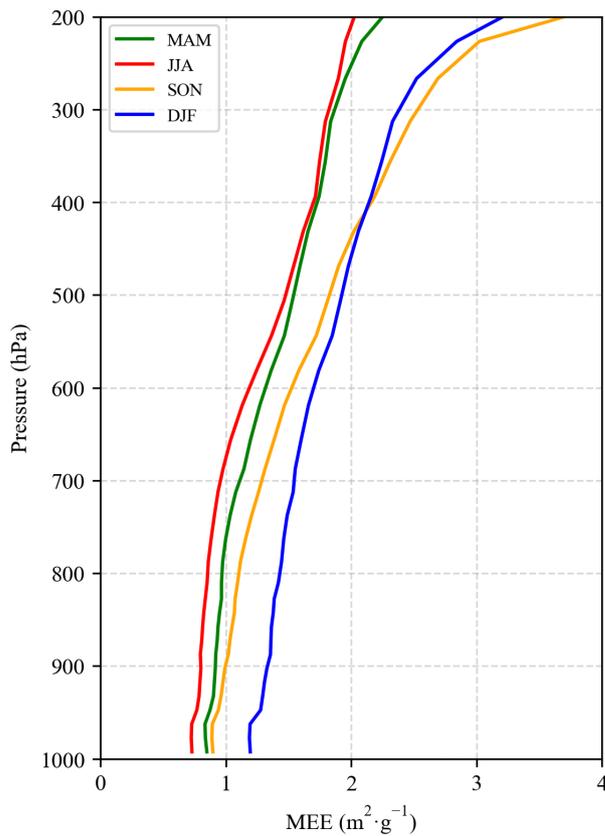
**Xiaofeng Xu et al.**

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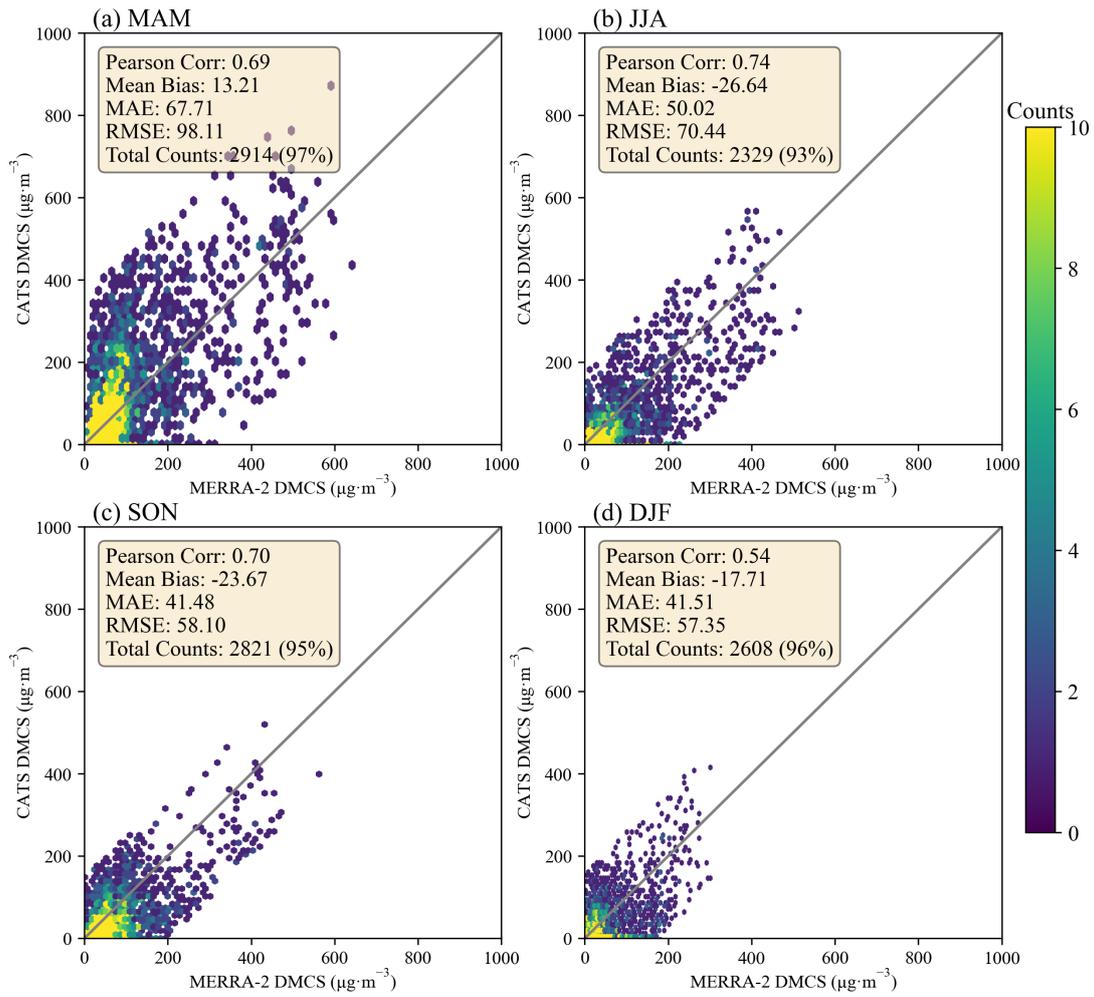
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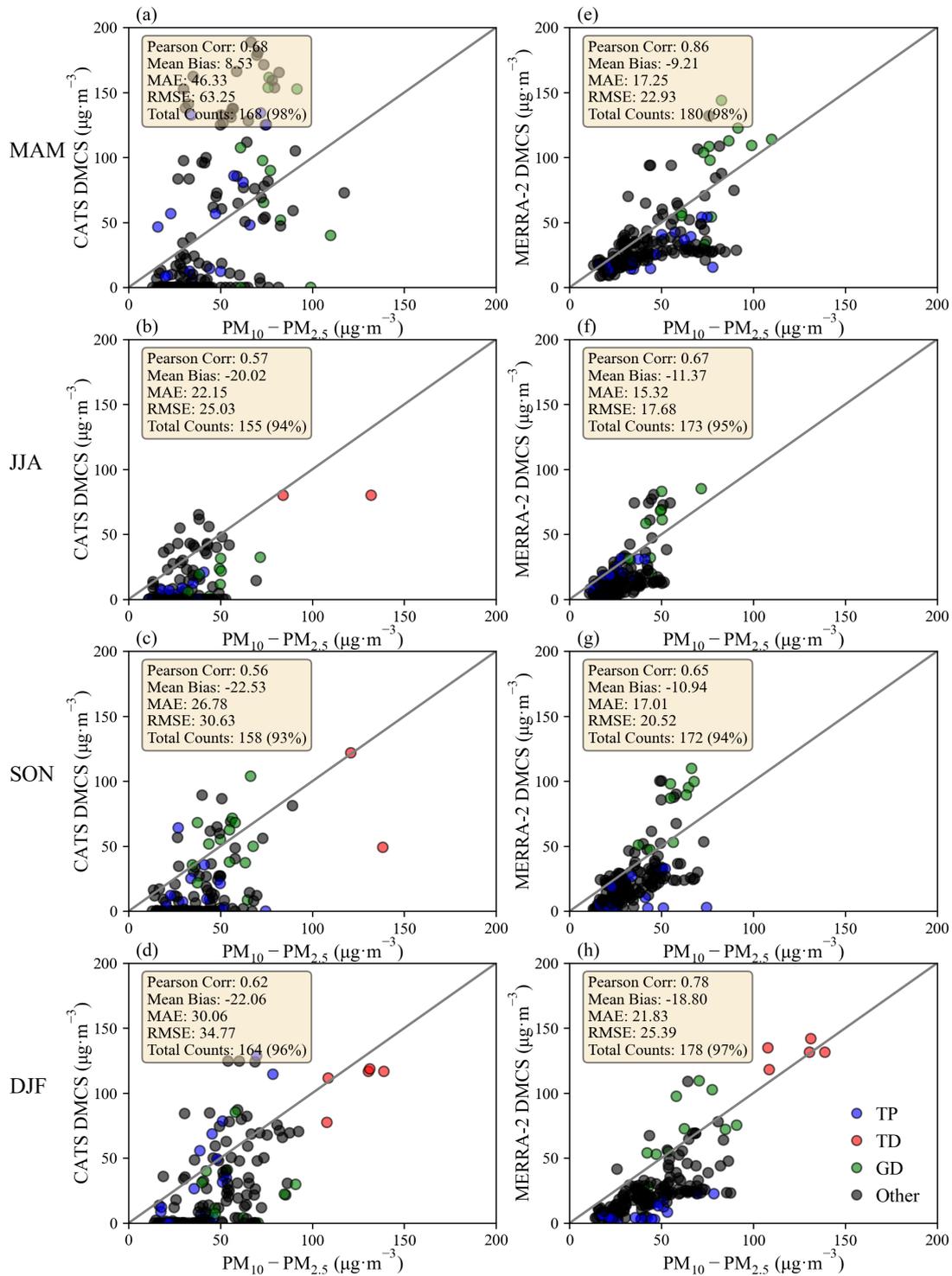
**Figure S1.** Horizontal distribution of the DustCOMM MEE product over the study region at 581.25 hPa. The 581.25 hPa level corresponded to an altitude of approximately 4 km, which represented the principal dust transport layer downwind of the TD, Qaidam Basin, and the TP. The MEE values across the entire region generally ranged between 1.6 and 2.9  $\text{m}^2 \cdot \text{g}^{-1}$ .



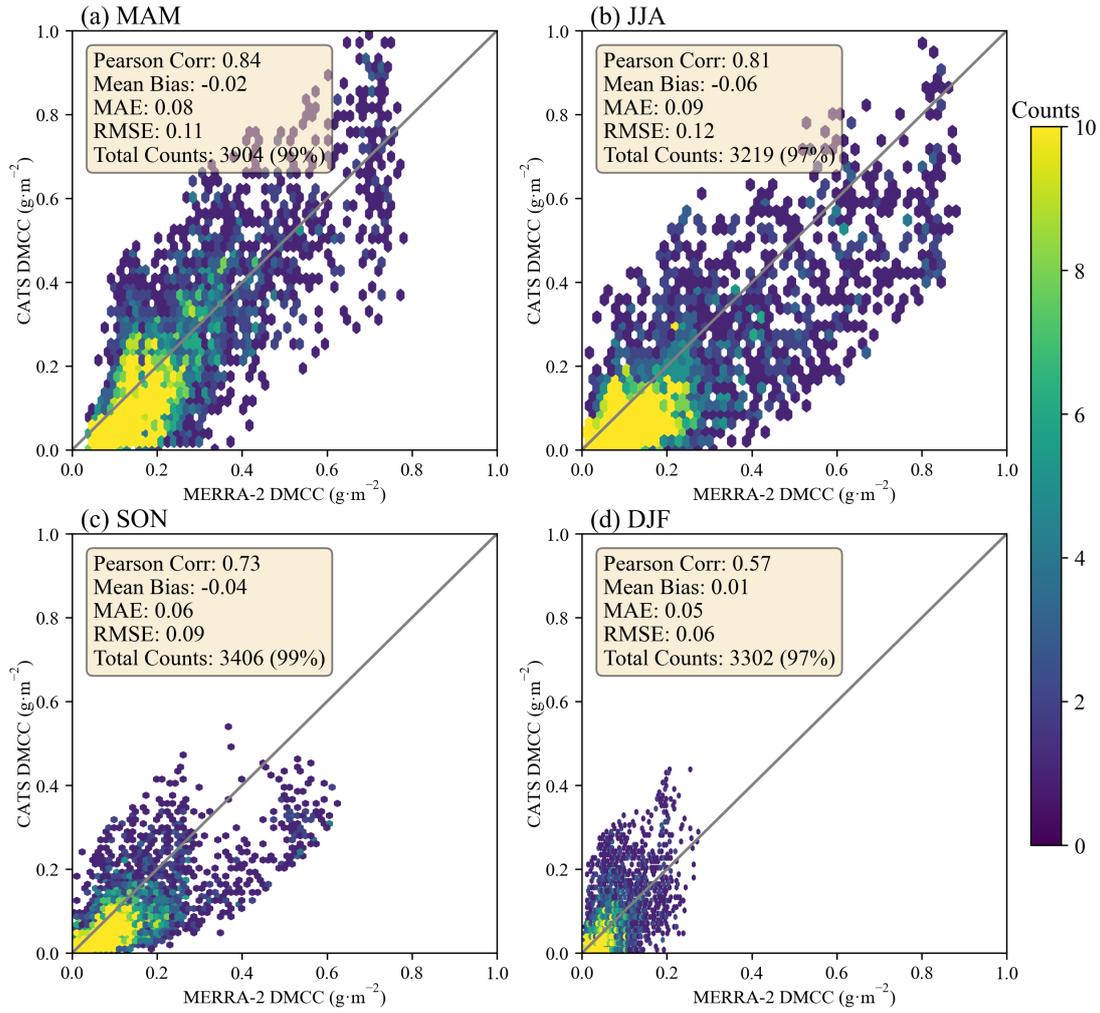
**Figure S2.** Vertical distribution of the DustCOMM MEE product over the TD (35°–42°N, 75°–90°E). The MEE values showed a gradual increase with altitude.



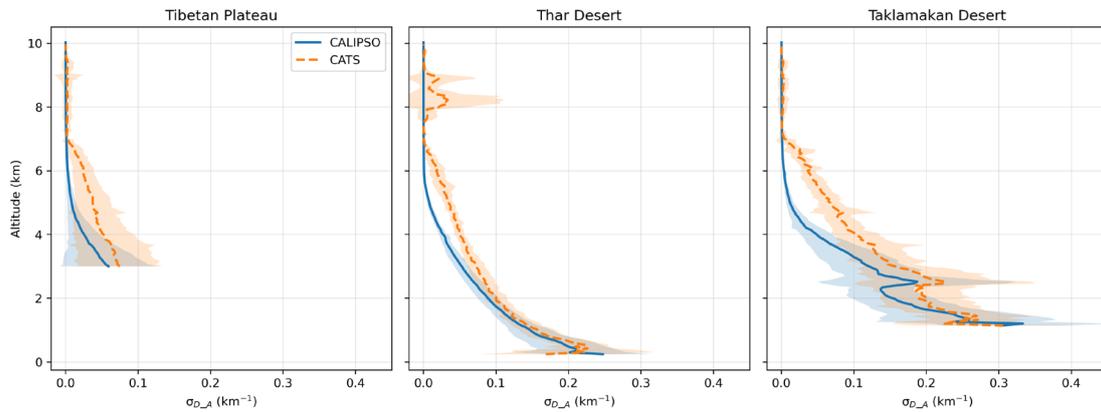
**Figure S3.** Comparison of CATS 0–180 m DMCS and MERRA-2 DMCS at seasonal-mean scales. The number in parentheses following the total sample size indicated the percentage of samples retained after removing outliers using the interquartile range (IQR) method.



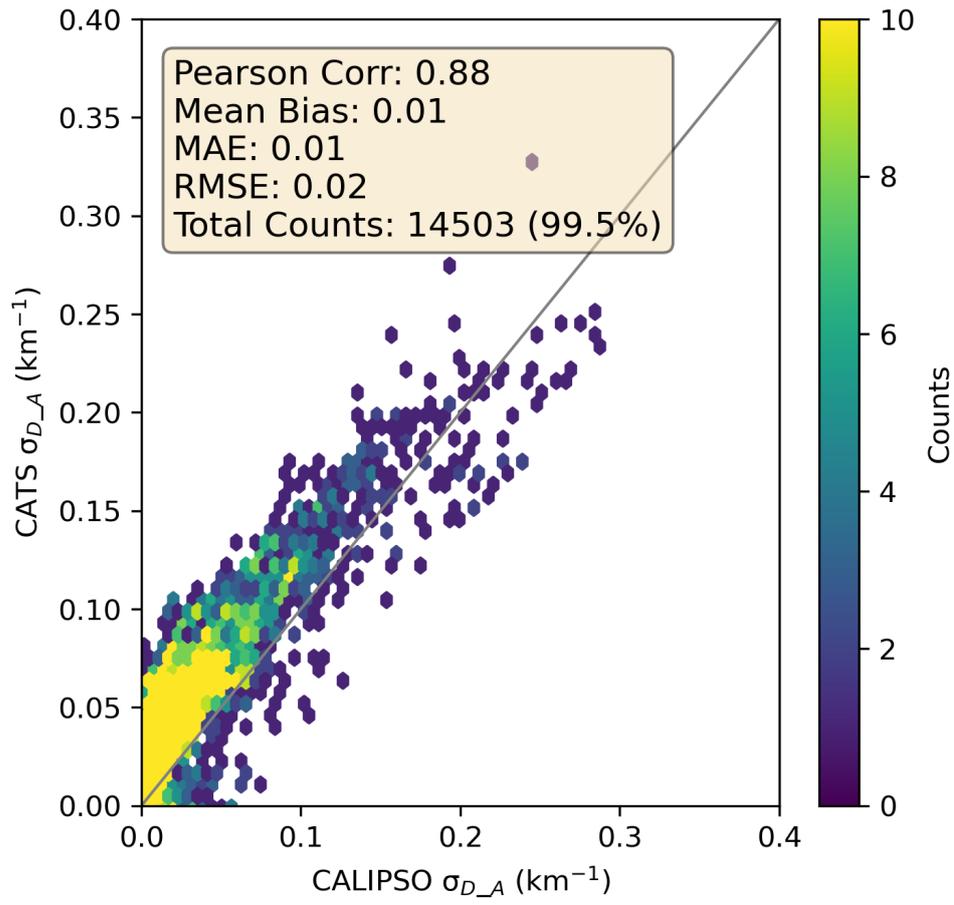
**Figure S4.** Comparison of surface PM<sub>10</sub>-PM<sub>2.5</sub> observations with (a-d) CATS 0-180 m DMCS and (e-h) MERRA-2 DMCS at seasonal-mean scales. The number in parentheses after the total sample size indicated the percentage of samples remaining after outlier removal using the interquartile range (IQR) method. PM<sub>10</sub>-PM<sub>2.5</sub> means the difference of PM<sub>10</sub> and PM<sub>2.5</sub>.



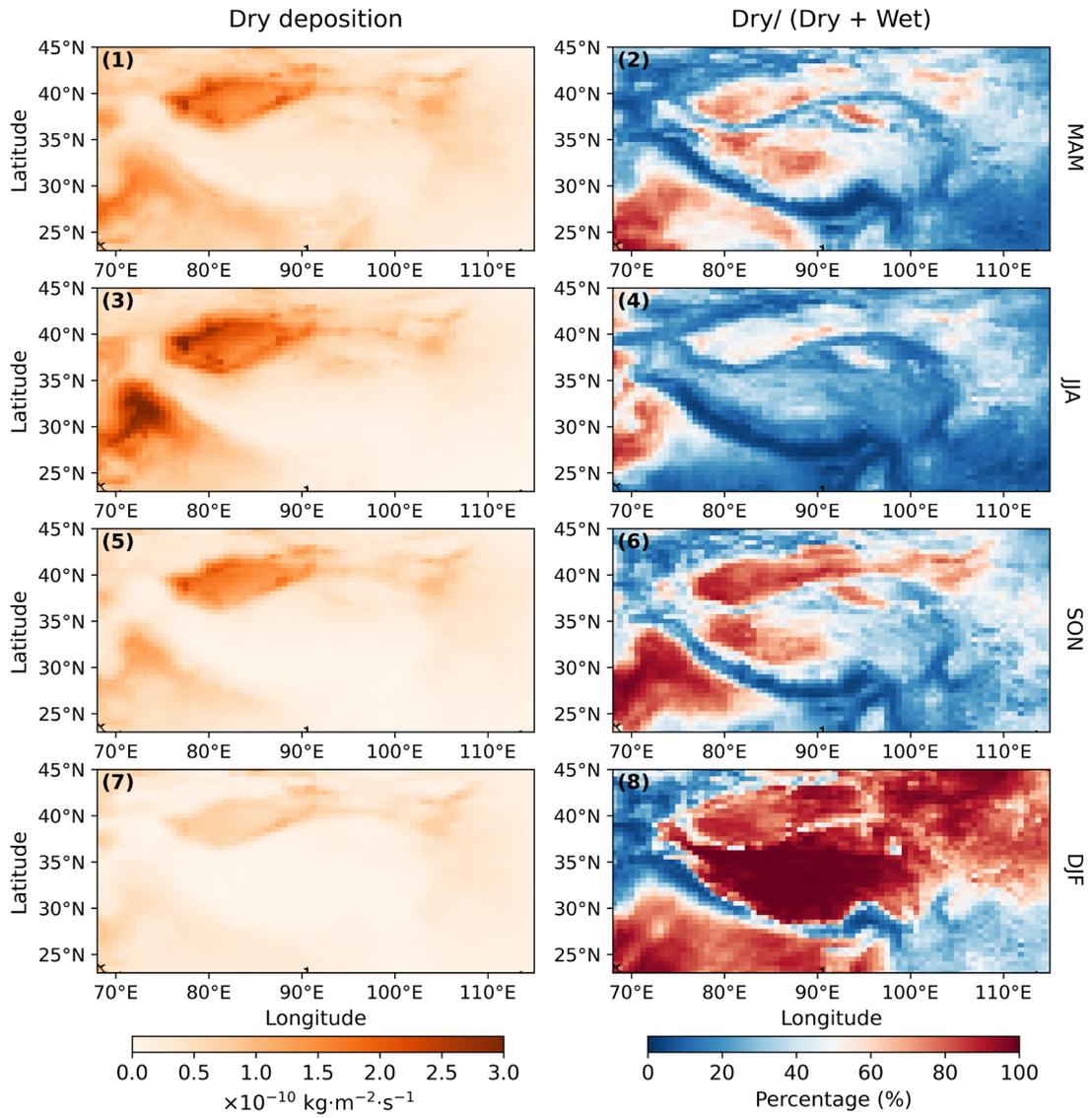
**Figure S5.** Comparison of DMCC between CATS and MERRA-2 at seasonal-mean scales. The number in parentheses following the total sample size indicated the percentage of samples retained after removing outliers using the interquartile range (IQR) method.



**Figure S6.** Comparison of springtime  $\sigma_{D,A}$  profiles at 532 nm between CATS and CALIPSO.



**Figure S7.** Comparison of annual-mean  $\sigma_{D,A}$  at 532 nm between CATS and CALIPSO Level 3 data. The number in parentheses following the total sample size indicated the percentage of samples retained after removing outliers using the interquartile range (IQR) method.



**Figure S8.** The seasonal distributions of dust dry deposition and its percentage in total deposition (dry and wet deposition) from MERRA-2 dataset of 2015-2017.