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PUBLICATIONS

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Supporting Information for

The efficient integration of dust and numerical weather prediction for renewable energy applications

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Contents of this file

Introduction

This supporting information provides figures related to: 1) wind and PM10 evaluation using different methods or lead days (Figures S1-S4); 2) AOD and DOD climatology comparison (Figure S5); 3) AD-Net comparison after converting dust concentration to dust extinction coefficient (Figure S6); and 4) vertical and horizontal kinetic energy at different pressure levels (Figures S7-S8).

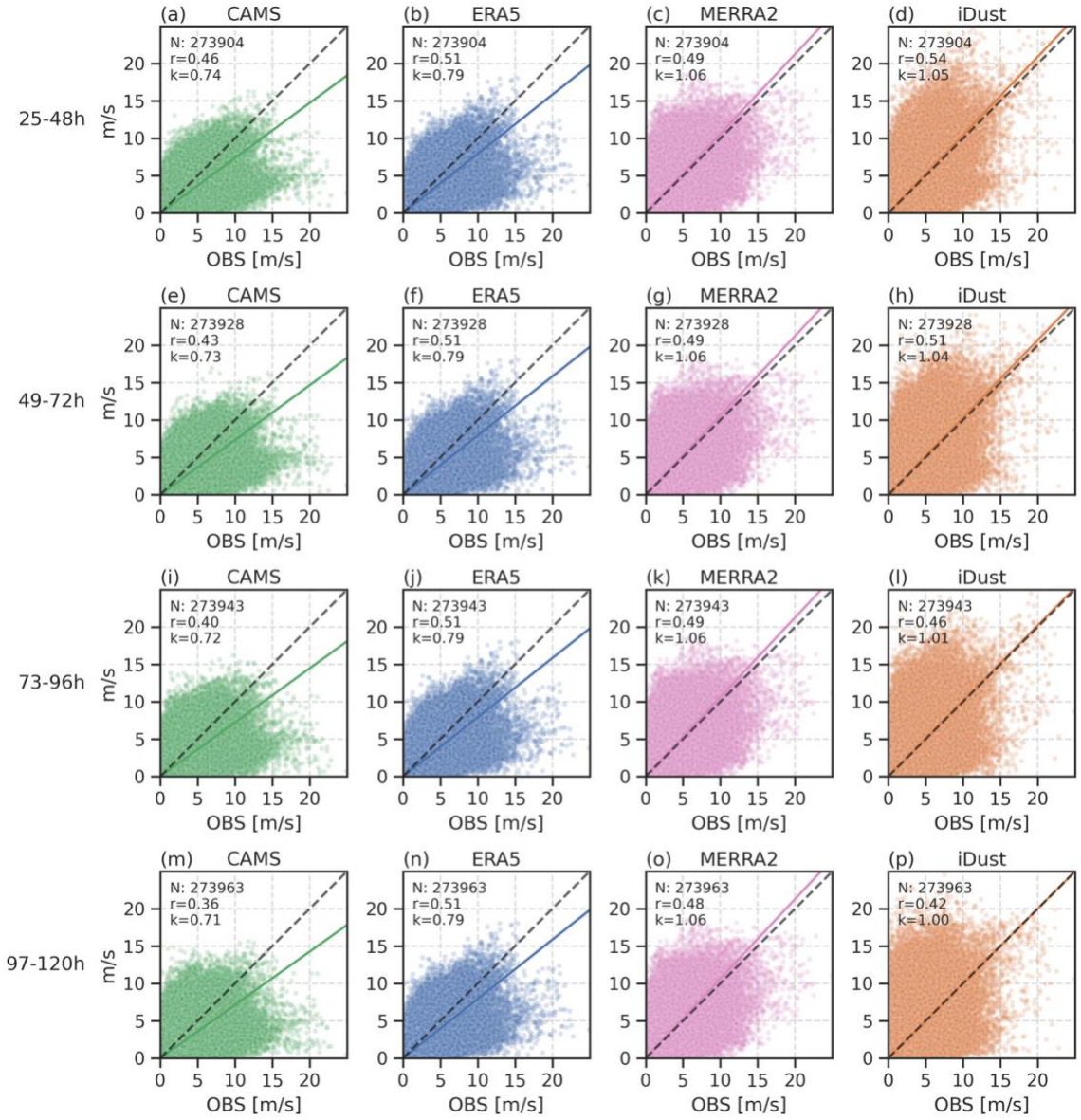

Figure S1. Same as Figure 2a-d, but shows the results for other lead days.

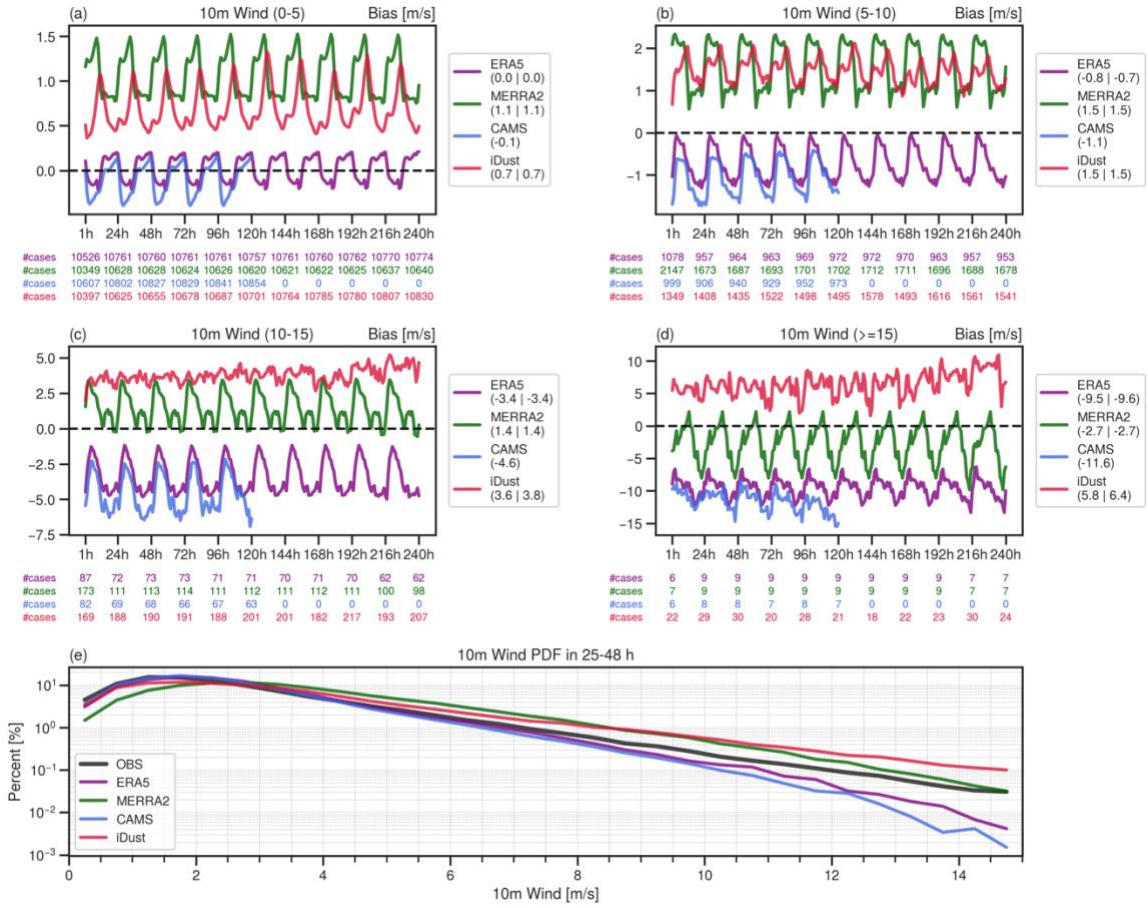

Figure S2. (a-d) 10-meter wind speed biases categorized into four levels (0-5, 5-10, 10-15, and above 15 m/s), with sample sizes for different lead times. Legend also shows the mean biases for the first 5 and 10 days (if available). (e) Probability density function (PDF) distribution of all samples.

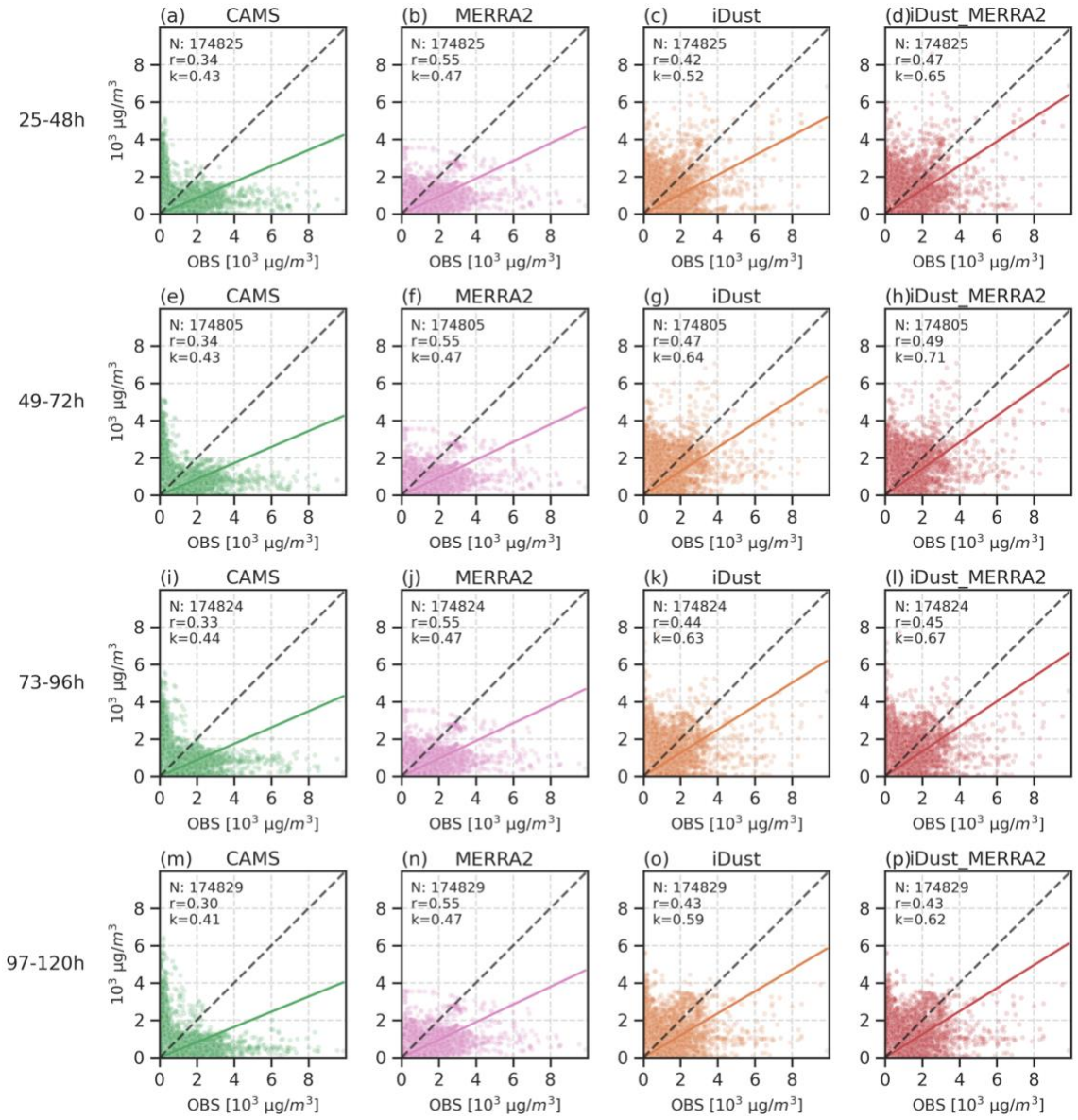

Figure S3. Same as Figure 3 a-d, but shows the results for other lead days.

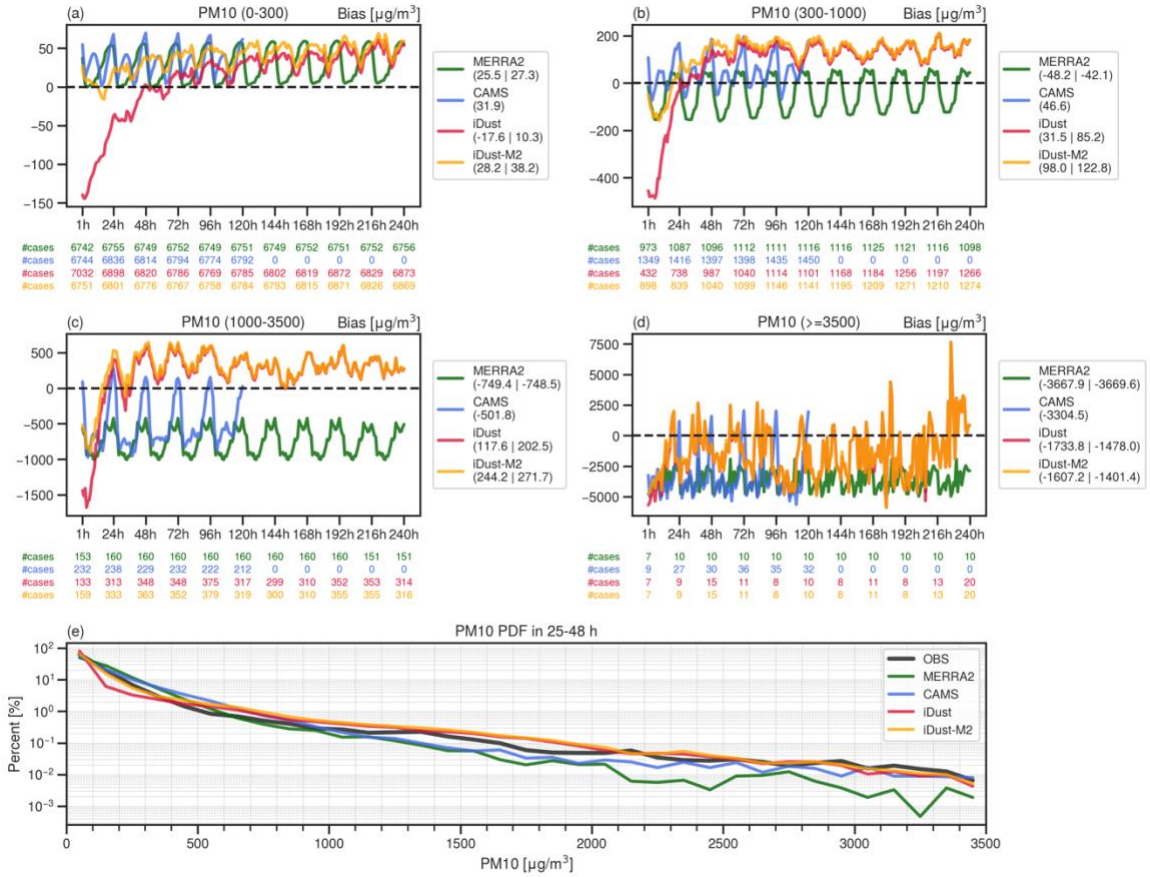

Figure S4. Same as Figure S2, but shows the intensity of PM10.

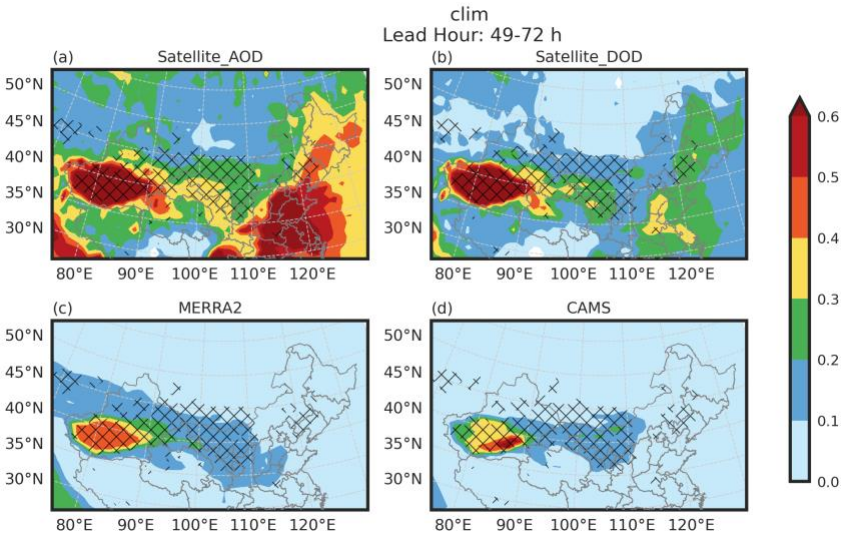

Figure S5. Climatology AOD and DOD.

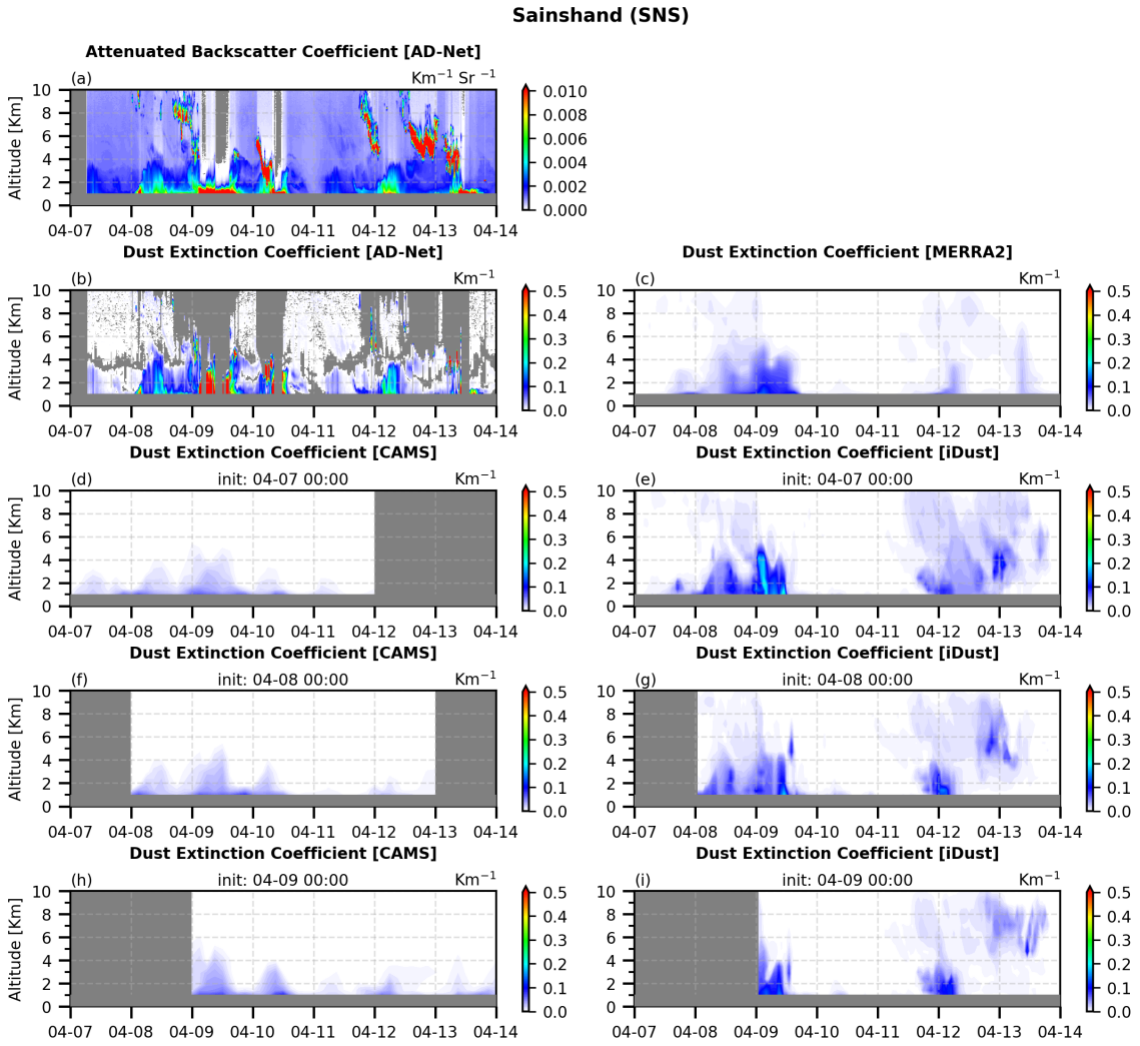

Figure S6. Same as Figure 7, but (c-i) converts the dust concentration to dust extinction coefficients using mass extinction coefficients. MERRA2 and iDust use the mass extinction coefficients in Equation 17, whereas CAMS applies coefficients of 3943.30, 948.44, and 56.96 m^2/kg for size bins between 0.03, 0.55, 0.9, and 20 $\boldsymbol{\mu m}$, respectively. These mass extinction coefficients are calculated based on the Mie Theory.

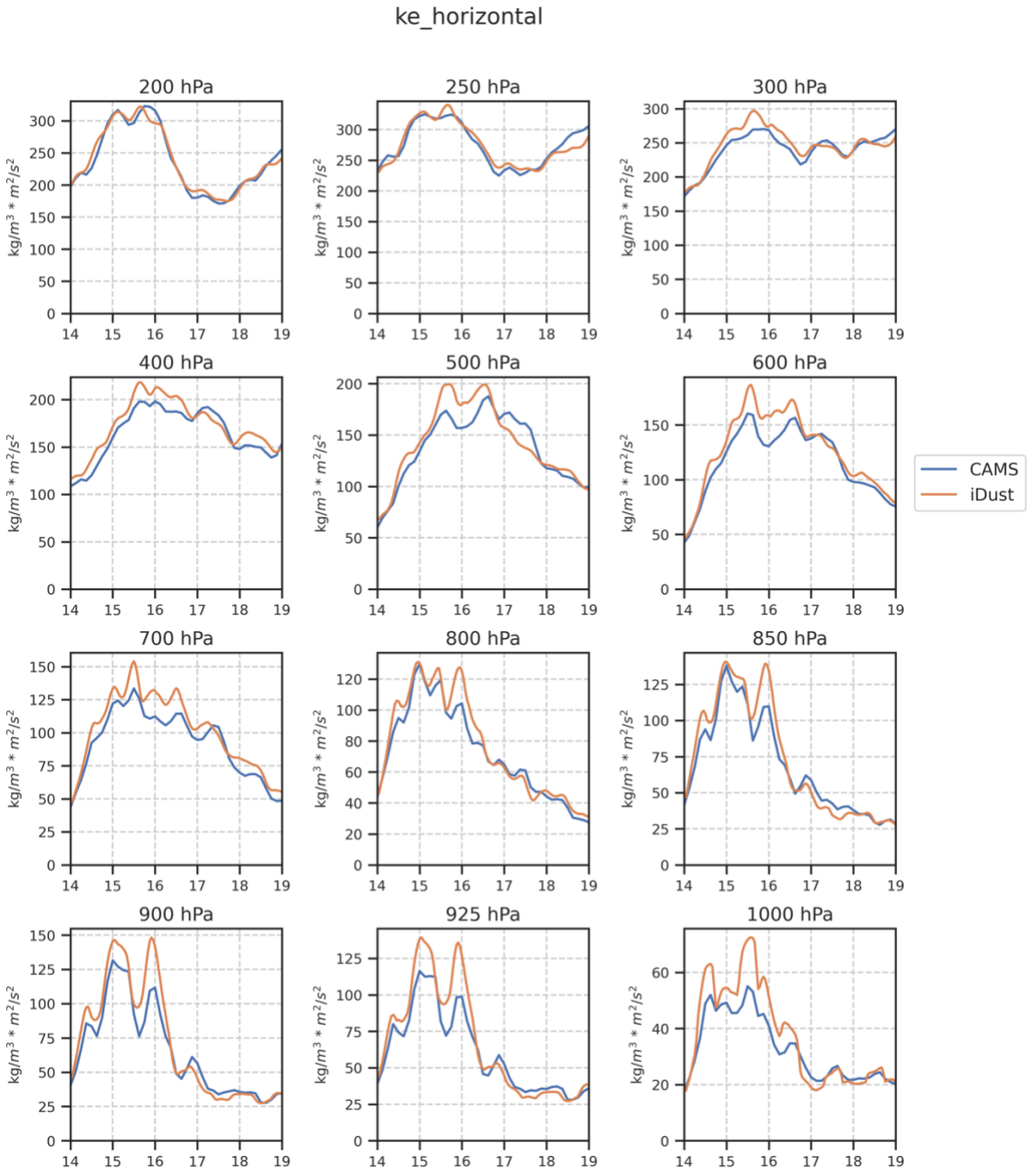

Figure S7. Same as Figure 10g, but at different pressure levels.

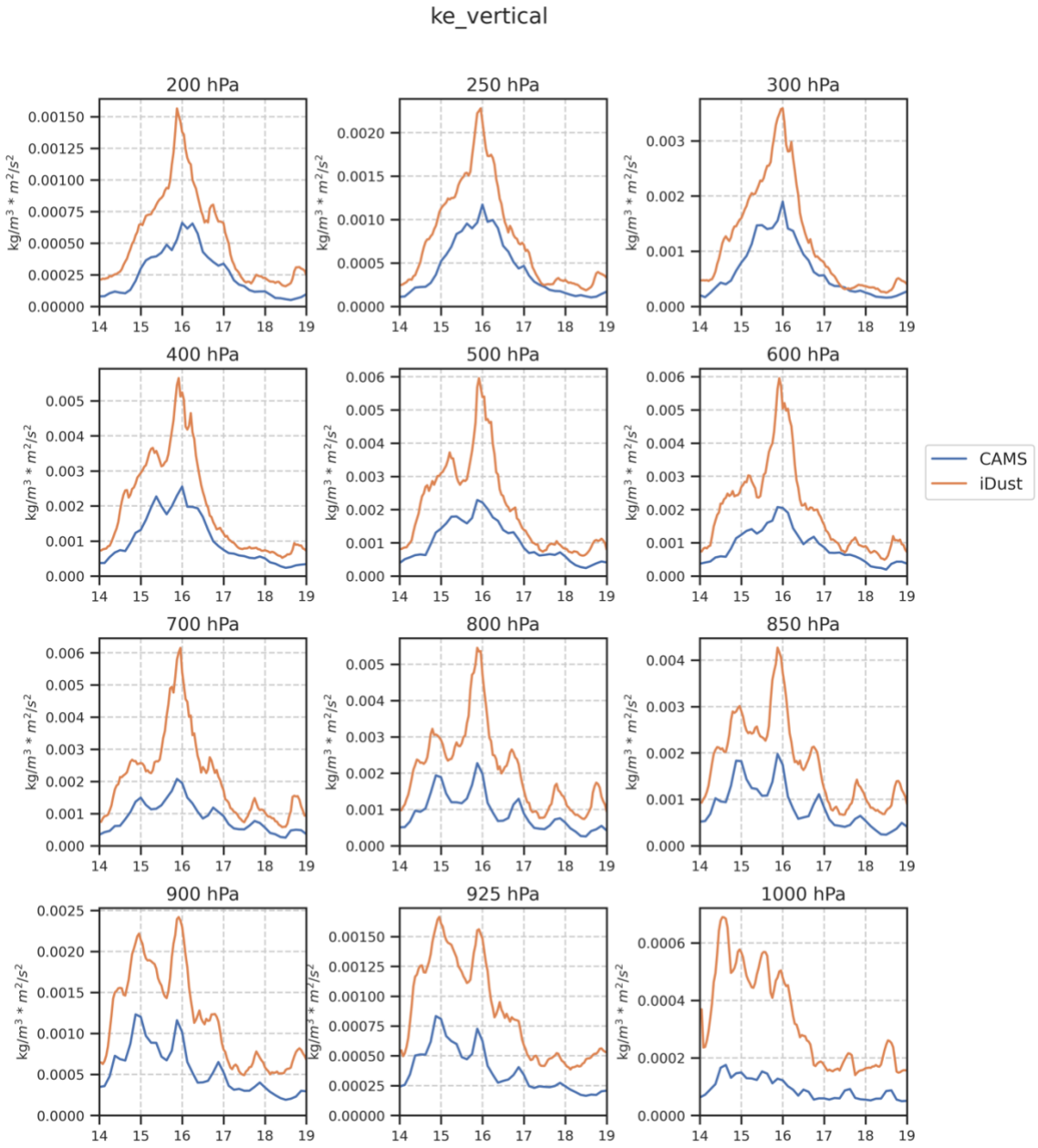

Figure S8. Same as Figure 10d, but at different pressure levels.