Atmospheric
Chemistry
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Supplement of

Long-range transport of coarse mineral dust: an evaluation of the Met Office Unified Model against aircraft observations

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Table S1: Instrumental size bins used to construct equivalent number concentrations for comparison against model size bins. Diameter ranges are given in μm.

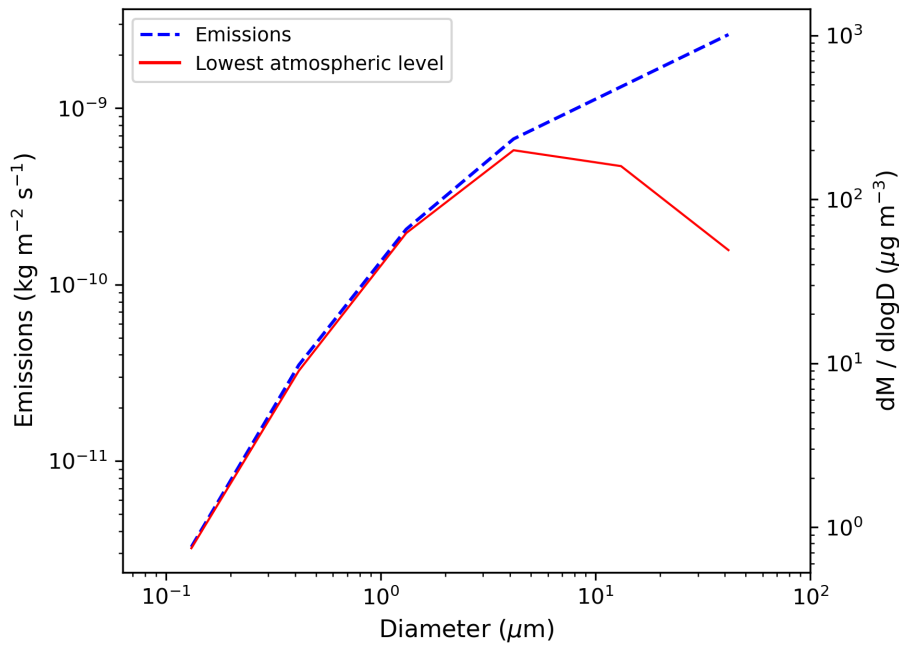| Model size bin	Fennec	AER-D	SALTRACE
Bin 1 (0.0632 to 0.2)	PCASP 0.132 − 0.198	PCASP 0.121 - 0.198	UHSAS 0.06949 − 0.20242 (bin 1 − bin 14)
Bin 2 (0.2 to 0.632)	PCASP 0.198 − 0.609	PCASP 0.198 − 0.609	UHSAS 0.20242 − 0.30687 (bin 15 - bin 25) + SkyOPC 0.3 − 0.615 (bin 2 - bin 6) + $\frac{1}{2}$ bin 7
Bin 3 (0.632 to 2)	PCASP 0.609 − 2.093	PCASP 0.609 − 2.093	SkyOPC 0.615 − 1.0 $\frac{1}{2}$ bin 7 + (bin 8 − bin 10) + CAS 1.11 − 2.11 (bin 4 − bin 9) + $\frac{1}{2}$ bin 10
Bin 4 (2 to 6.32)	PCASP 2.093 − 3.492 + CDP 3.052 − 6.463	PCASP 2.093 − 3.492 + CDP 3.052 − 6.463	CAS 2.11 − 6.43 $\frac{1}{2}$ bin 10 + (bin 11 − bin 15)
Bin 5 (6.32 to 20)	CDP 6.463 − 20.526	CDP 6.463 − 21.897	CAS 6.43 − 20.11 (bin 16 − bin 22) + $\frac{1}{2}$ bin 23
Bin 6 (20 to 63.2)	CDP 20.526 − 39.600 + CIP15 37.5 − 67.5	2DS 20 − 65	CAS 20.11 − 61.31 $\frac{1}{2}$ bin 23 + (bin 24 − bin 29)

Figure S1: Model emitted dust mass (dashed blue line) and the mass size distribution (solid red line) in the lowest atmospheric level (0-36 m) at the Sahara (10 °W-25 °E, 18-29 °N).
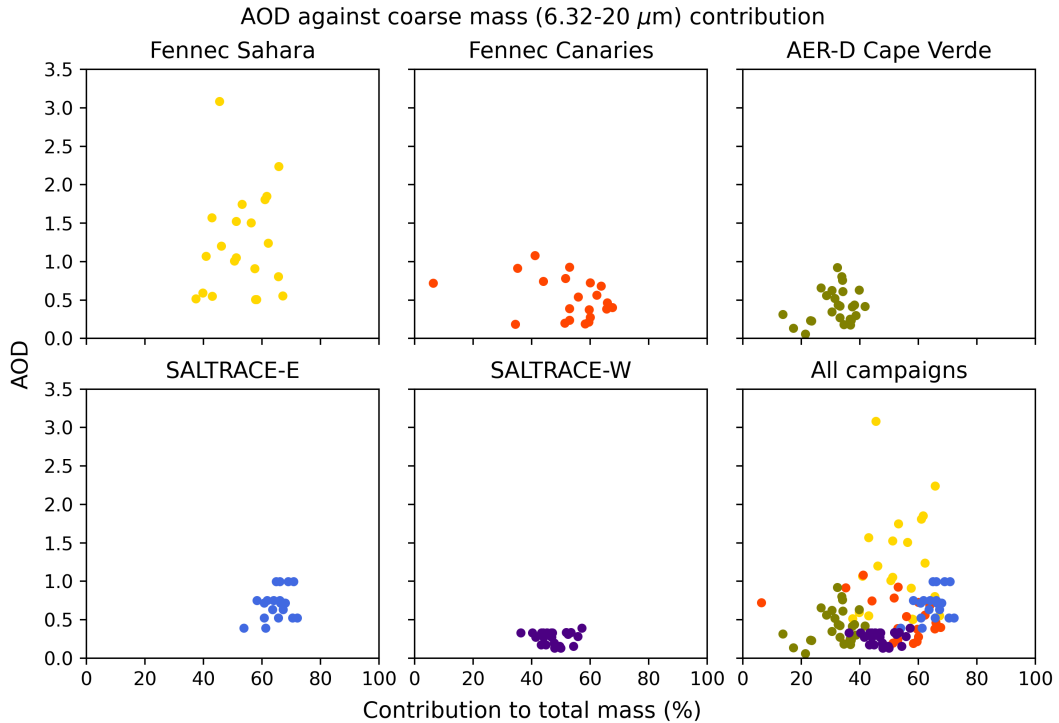

Figure S2: AOD against coarse mass (6.32-20 µm; size bin 5) contribution to total mass in each campaign. For Fennec and AER-D, AODs represent particles with diameters below 3 μm and mass contribution was averaged over profiles between 1-5 km at the Sahara, 0-5.5 km at the Canaries and 0-5 km at Cape Verde. For SALTRACE, AOD represents the full size range and mass contribution is taken from horizontal segments.