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Aircraft engine dust ingestion at global airports

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Supplement

Region	Lidar Ratio at 532 nm (sr)
Western/Central Sahara Desert, North Atlantic Ocean	56
Eastern Sahara Desert	53
Middle East Arabian Penninsula, Central Asia	40
South and East Asia, North Pacific Ocean	46
Europe	56
North America	49
South America	42

Table S 1: Regional lidar ratios applied in LIVAS dataset taken from Amiridis et al., (2013), Marinou et al., (2017), and Proestakis et al., (2018).

Flight Phase	t/s	t/min	z/feet	z/m	w_{core}/kg/s	k_f
taxi	890	14.8	0	0	19	0.9
take-off	10	0.2	0	0	112	0.7
	60	1.0	35	11	114	0.7
	60	1.0	1,500	457	111	0.7
climb	3	0.1	1,500	457	99	0.8
	10	0.2	2,500	762	97	0.8
	23	0.4	4,000	1,219	95	0.8
	45	0.8	6,000	1,829	91	0.8
	49	0.8	8,000	2,438	88	0.8
	51	0.9	10,000	3,048	83	0.8
	60	1.0	12,000	3,658	82	0.8
	80	1.3	14,000	4,267	79	0.8
	100	1.7	16,000	4,877	76	0.8
	120	2.0	20,000	6,096	69	0.8

Table S 2: Departure (ascent) values applied to calculate dust dose, taken from Clarkson (2020).

Flight Phase	t/s	t/min	z/feet	z/m	w_{core}/kg/s	k_f
ground	600	10.0	0	0	19.23	0.9
	16	0.3	0	0	90.4	0.7
	25	0.4	0	0	27.03	0.8
Hold and approach	180	3.0	1,500	457	28.17	0.8
	600	10.0	3,000	914	46.95	0.8
Descent	25	0.4	1,500	457	18.82	1.0
	96	1.6	2,000	610	18.69	1.0
	91	1.5	4,000	1,219	18.1	1.0
	87	1.5	6,000	1,829	17.28	1.0
	85	1.4	8,000	2,438	16.24	1.0
	83	1.4	10,000	3,048	15.29	1.0
	81	1.4	12,000	3,658	15.06	1.0

	80	1.3	14,000	4,267	14.7	1.0
	78	1.3	16,000	4,877	14.38	1.0
	76	1.3	18,000	5,486	14.7	1.0
	75	1.3	20,000	6,096	16.33	1.0

Table S 3: Arrival (descent) values applied to calculate dust dose, taken from Clarkson (2020).

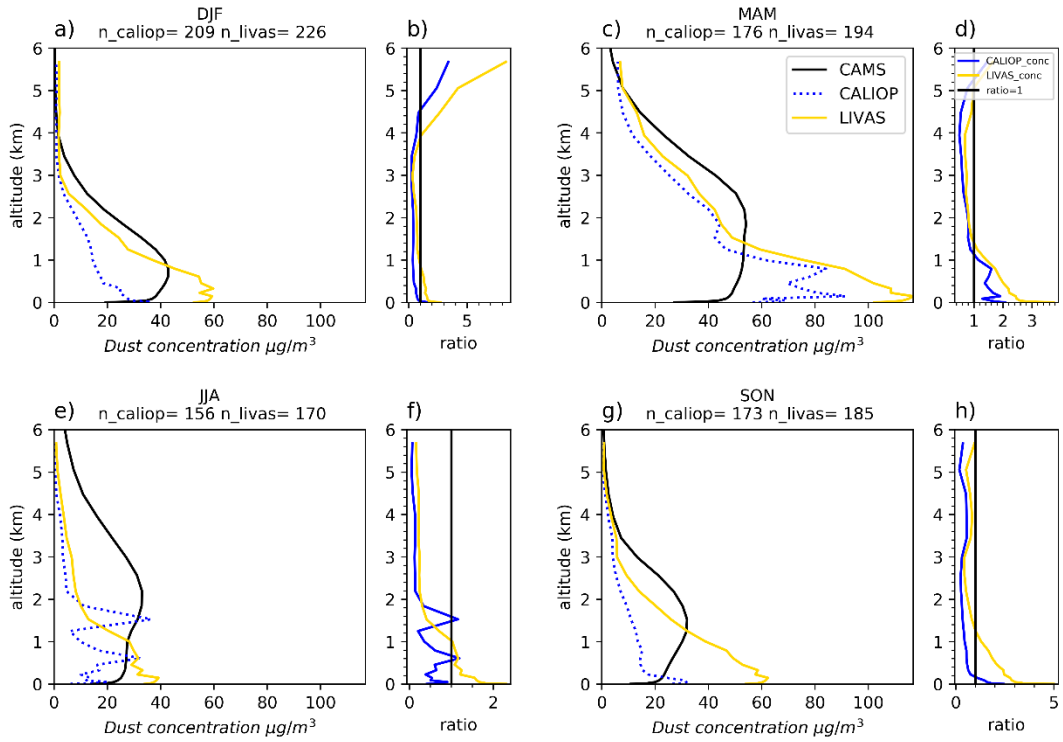

Figure S 1: Same as Figure 4 in main text, except for Beijing.

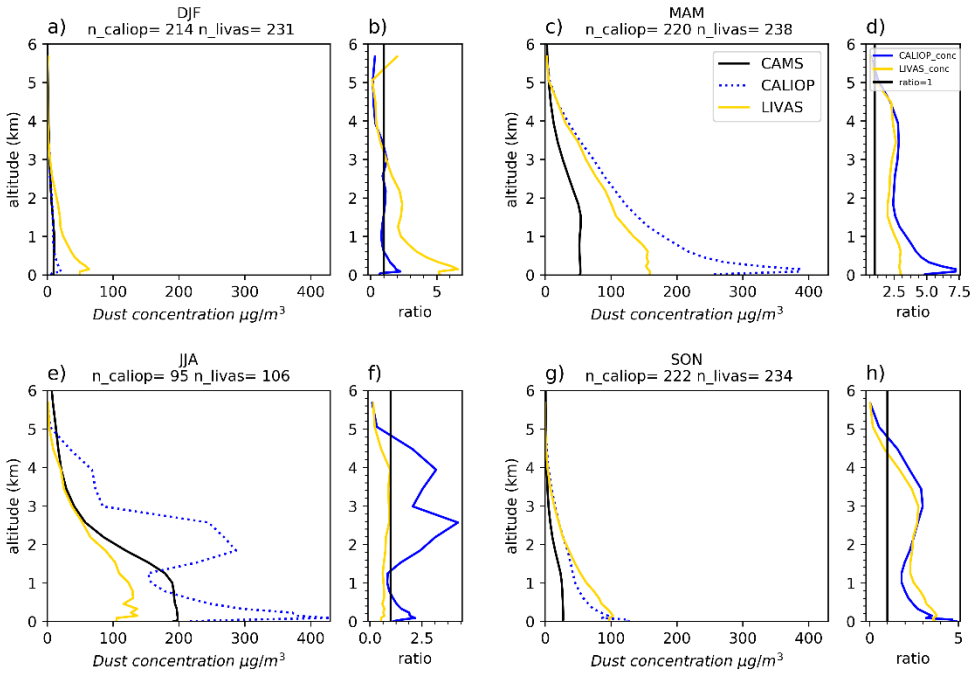

Figure S2: Same as Figure 4 in main text, except for Delhi

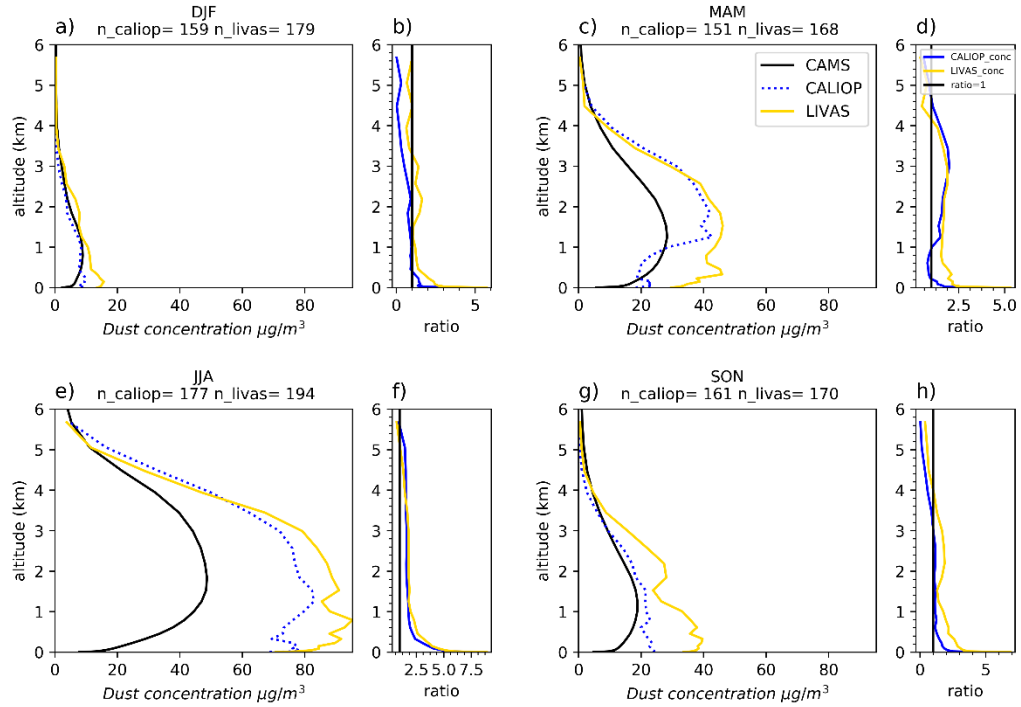

Figure S 3: Same as Figure 4 in main text, except for Marrakesh

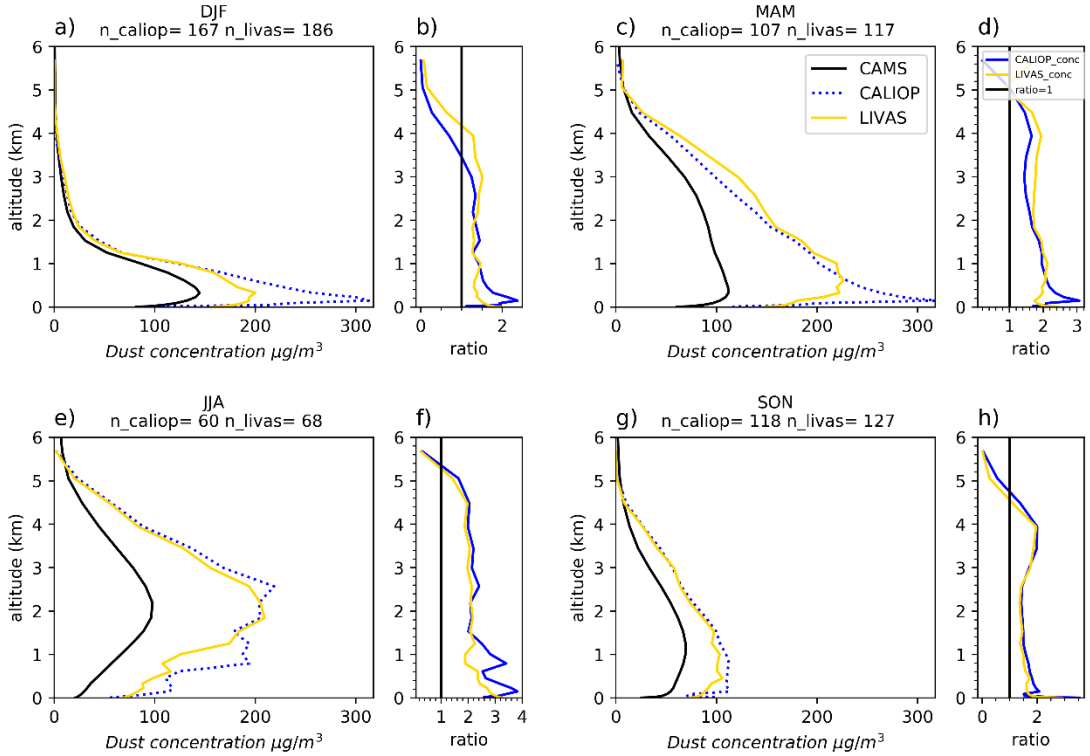

Figure S 4: Same as Figure 4 in main text, except for Niamey.

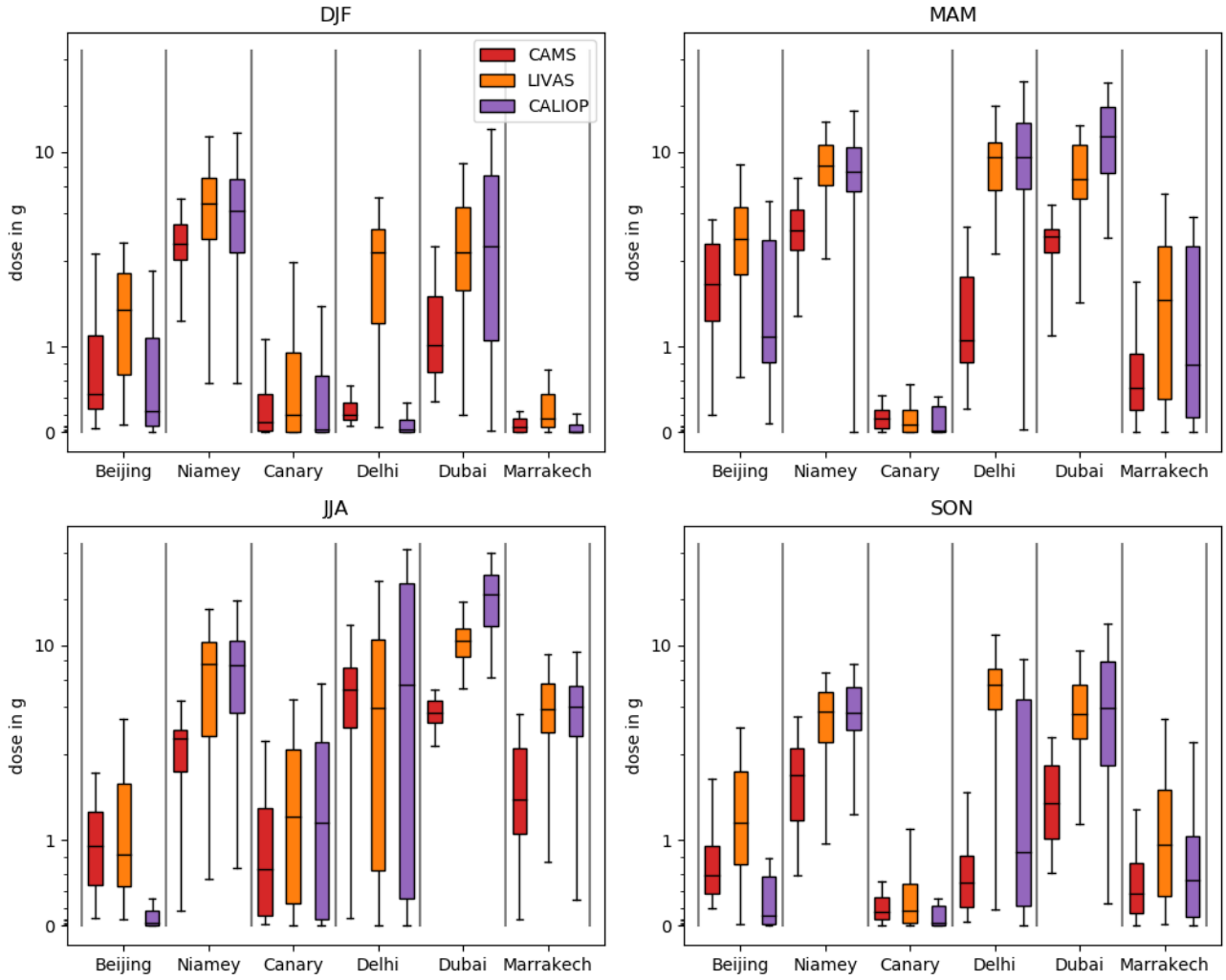

Figure S5: Same as Figure 8 in main text, except for ascent (departure).