Atmospheric
Chemistry
and Physics

Supplement of

Amazonian aerosol size distributions in a lognormal phase space: characteristics and trajectories

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Supplement

Table S1. Mean lognormal fit parameters of Amazonian (-4 UTC) aerosols based on one year of observation (May/2021 to April/2022), for the sub-50 nm, Aitken (50-100 nm), and accumulation modes, under different conditions. The dry season spans from August to November and the wet season from February to May. The rain/no rain cases were selected in the afternoon.

|		Sub-50nm			Aitken			Accumulation		
		$N\ (cm^{-3})$	$D_g\ (nm)$	σ	$N\ (cm^{-3})$	$D_g\ (nm)$	σ	$N\ (cm^{-3})$	$D_g\ (nm)$	σ
December-January		48.75	28.74	1.284	233.11	73.21	1.325	435.74	172.51	1.410
February-March		58.58	25.35	1.279	245.65	67.41	1.301	233.04	170.02	1.408
April-May		59.33	27.19	1.270	322.18	69.84	1.317	411.14	159.32	1.385
June-July		86.28	32.62	1.294	367.66	67.79	1.277	1221.95	146.58	1.451
August-September		61.61	29.94	1.275	312.26	68.20	1.293	1707.78	151.27	1.526
October-November		62.41	29.92	1.288	292.15	71.72	1.322	994.23	162.54	1.489
Dry	00 LST	74.57	32.53	1.316	323.55	69.40	1.321	1365.82	156.70	1.515
	06 LST	65.76	31.02	1.297	311.01	68.93	1.332	1225.61	154.17	1.513
	12 LST	36.92	28.10	1.220	285.85	70.27	1.301	1555.31	157.15	1.511
	18 LST	53.13	29.52	1.270	273.94	69.41	1.299	1396.47	157.46	1.511
Wet	00 LST	64.18	28.14	1.305	292.25	69.80	1.310	311.52	164.46	1.398
	06 LST	66.45	25.92	1.277	272.36	68.19	1.326	234.05	161.51	1.401
	12 LST	53.88	27.57	1.225	275.79	67.16	1.295	395.09	163.27	1.396
	18 LST	46.06	26.60	1.264	269.93	68.79	1.298	322.89	164.93	1.390
Dry	-3h	55.69	24.84	1.237	375.61	68.76	1.433	1802.25	154.43	1.538
	-2h	50.94	27.23	1.240	419.29	69.02	1.346	1737.53	156.67	1.515
	-1h	61.72	28.57	1.239	339.03	68.31	1.303	1950.61	154.94	1.527
	Max. Precip	59.70	27.53	1.256	345.06	68.85	1.299	1796.28	154.74	1.538
	+1h	70.39	28.29	1.273	315.00	67.75	1.450	1743.10	151.95	1.536
	+2h	72.30	28.44	1.296	265.64	66.46	1.263	1794.06	152.65	1.548
	+3h	125.76	27.27	1.289	339.02	68.40	1.306	1774.73	154.01	1.515
Wet	-3h	68.64	26.79	1.262	268.71	69.44	1.301	257.72	168.19	1.391
	-2h	67.72	21.48	1.212	303.04	69.87	1.322	281.81	168.14	1.375
	-1h	50.52	25.39	1.237	269.50	69.89	1.306	303.20	165.58	1.397
	Max. Precip	56.29	25.03	1.245	270.80	67.27	1.325	269.70	166.34	1.398
	+1h	62.98	25.99	1.255	256.01	65.86	1.307	274.16	161.91	1.426
	+2h	79.43	29.19	1.300	227.89	66.25	1.316	212.07	164.99	1.403
	+3h	61.49	25.87	1.267	246.71	63.65	1.309	239.14	163.81	1.412
Dry / no rain	06 LST							1441.40	151.97	1.541
	08 LST							1524.83	152.99	1.540
	10 LST							1703.84	154.13	1.533
	12 LST							1914.27	154.53	1.517
Dry / rain	06 LST							1288.04	157.62	1.524
	08 LST							1385.26	159.37	1.535
	10 LST							1561.03	159.04	1.540
	12 LST							1549.94	160.24	1.546
Wet / no rain	06 LST							131.17	157.56	1.416
	08 LST							146.79	158.78	1.418
	10 LST							215.70	156.16	1.422
	12 LST							269.45	155.13	1.423
Wet / rain	06 LST							183.78	164.12	1.407
	08 LST							206.99	167.64	1.405
	10 LST							269.52	166.32	1.410
	12 LST							314.73	170.57	1.394
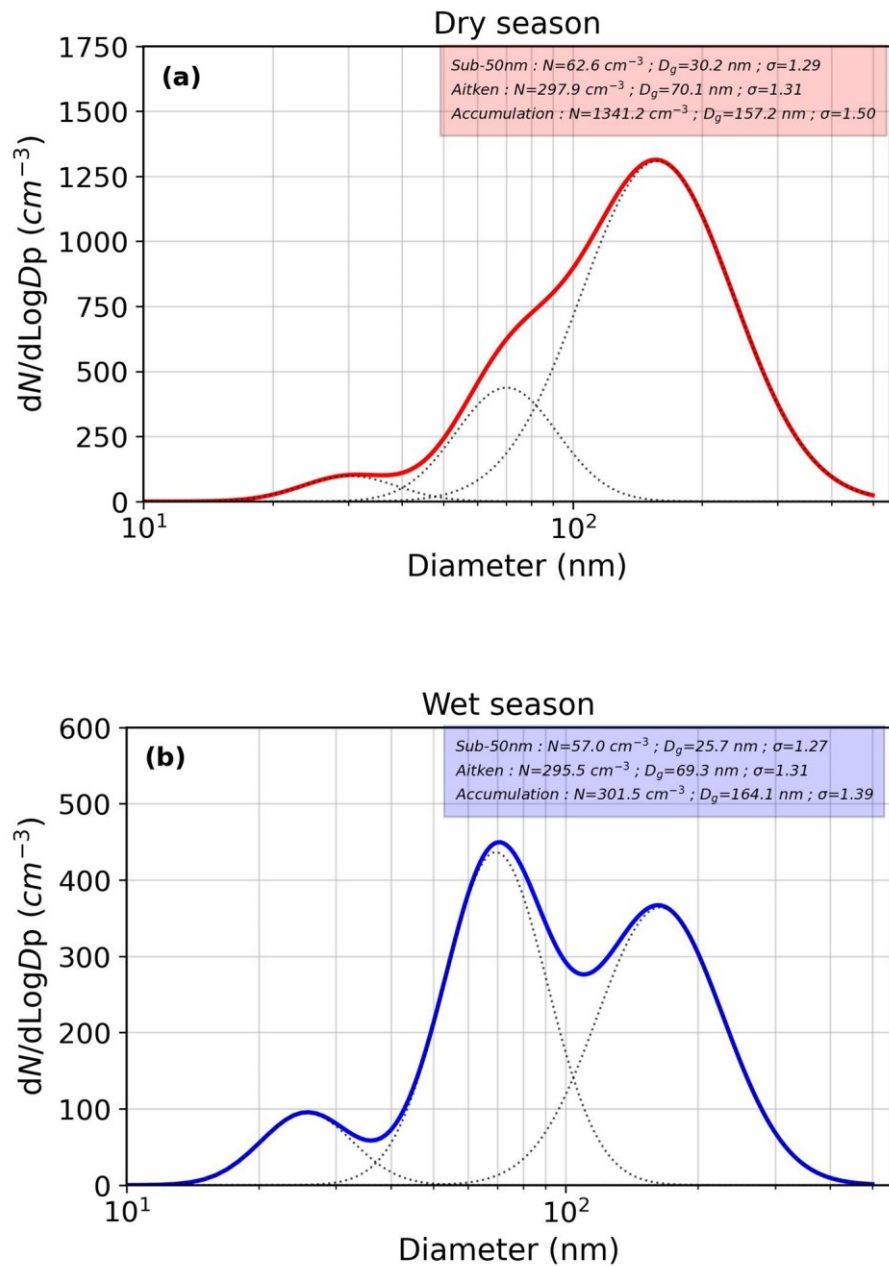
Figure S1. A glimpse of the Amazonian PNSD curve for (a) dry and (b) wet seasons. The colored curves represent the mean curve, and the dotted ones represent the modes. In the box, there are the mean values used to plot the curves.
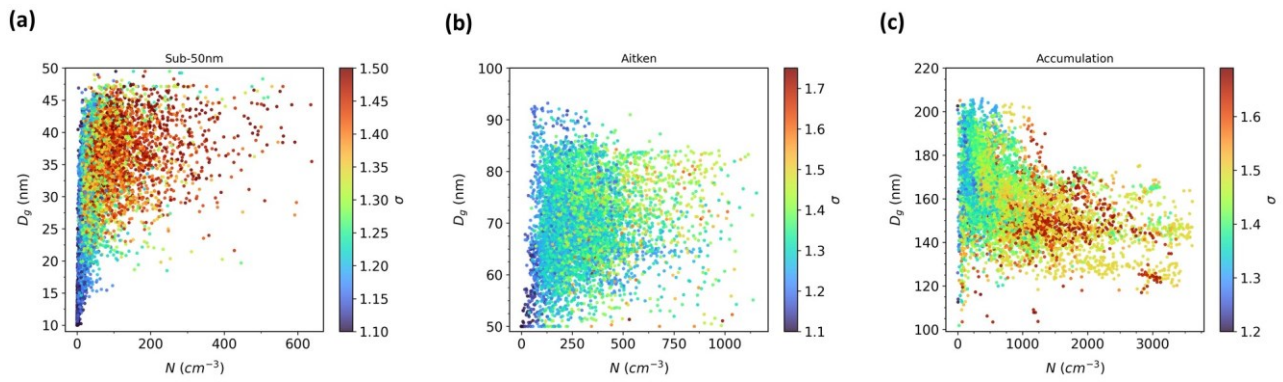
Figure S2. Hourly Amazonian PNSDs scattering. The patterns show the distribution of the (a) sub-50 nm, (b) Aitken (50-100 nm), and (c) accumulation modes. Every data point represents one full PNSD. The distribution considered spans one year of measurements (May 2021 to April 2022).
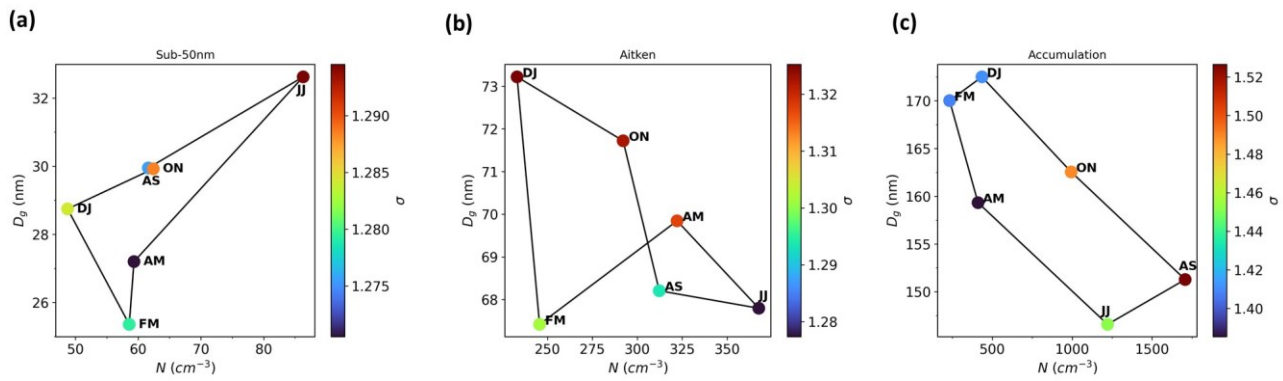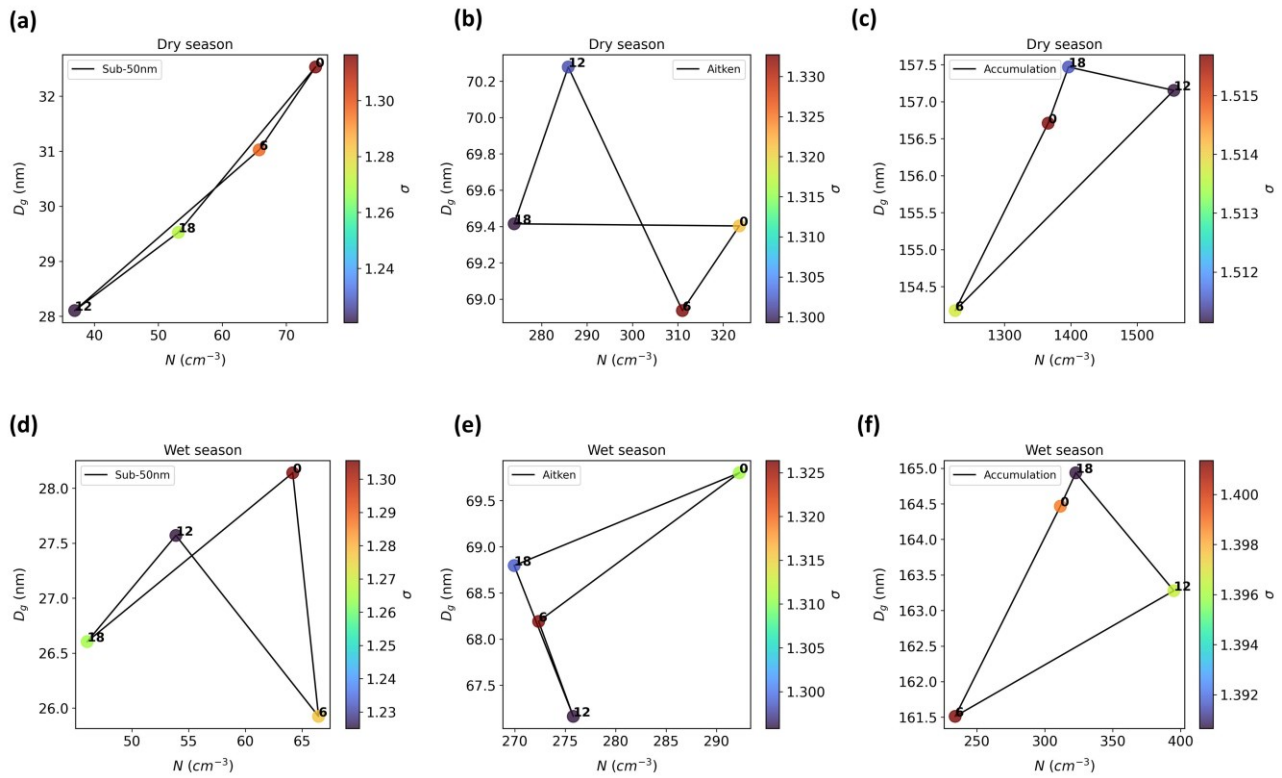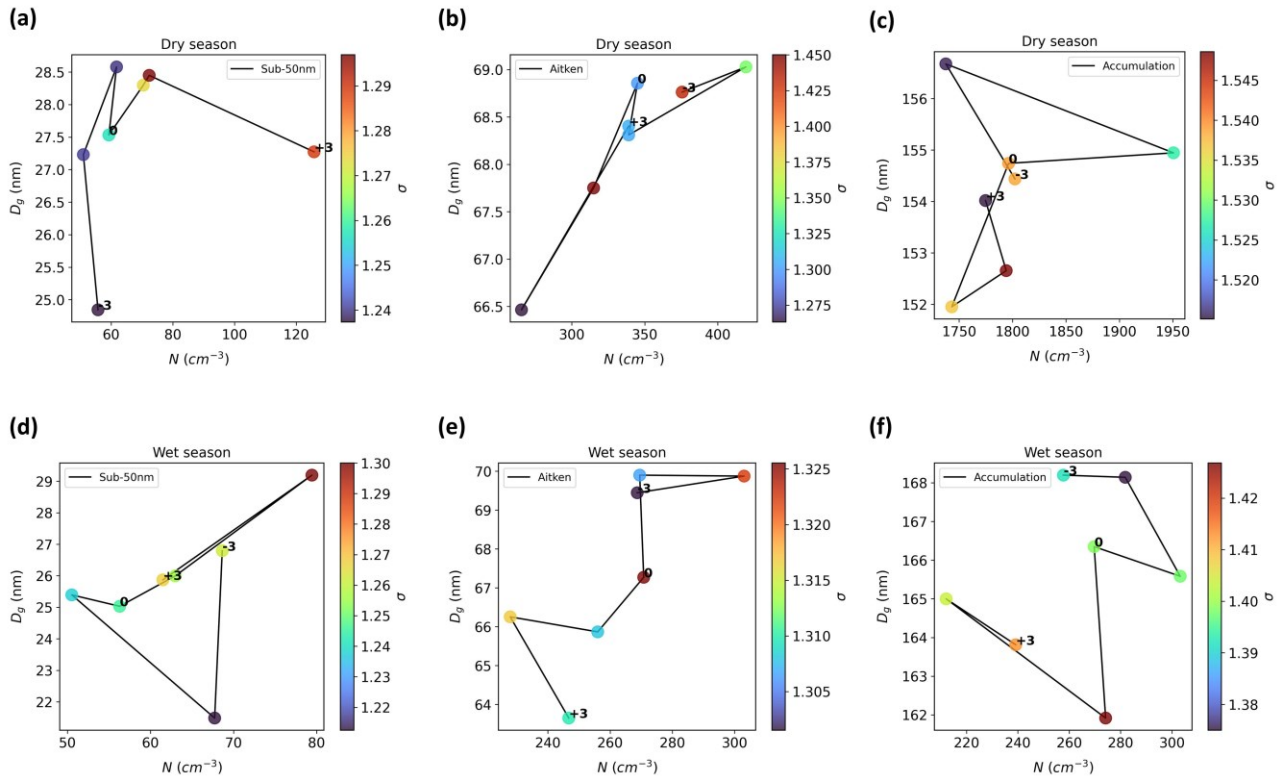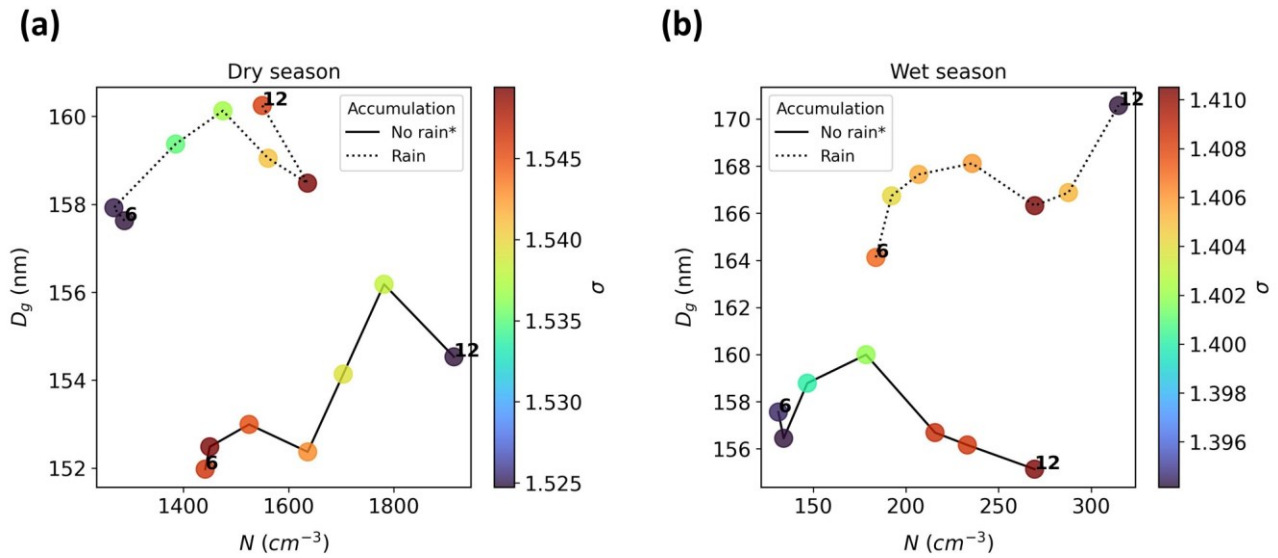

Figure S3. Seasonal trajectories of Amazonian PNSDs. The trajectory is shown in bimonthly resolution, showing the patterns of the (a) sub-50 nm, (b) Aitken (50-100 nm), and (c) accumulation modes.

Figure S4. Diurnal cycle trajectories of Amazonian PNSDs. The trajectories show the patterns of each mode (columns) for each season (rows). The numbers in black represent the time in LST.

Figure S5. Composites of Amazonian PNSDs before and after maximum precipitation. The trajectories span from 3 hours before (negative values) to 3 hours later (positive values), considering the moment of maximum precipitation (zero), for each mode (columns) and each season (rows).

Figure S6. Composites of Amazonian PNSDs for days with and without precipitation. The trajectories are in the morning, going from 6 to 12 LST, for cases of afternoons with and without rainfall events. An afternoon with rainfall was defined as having at least one record of rain intensity (RI) ≥ 0.5 mm.h⁻¹ from 13 to 18 LST, while a no rainfall afternoon was defined as having all records of RI < 0.5 mm.h⁻¹.
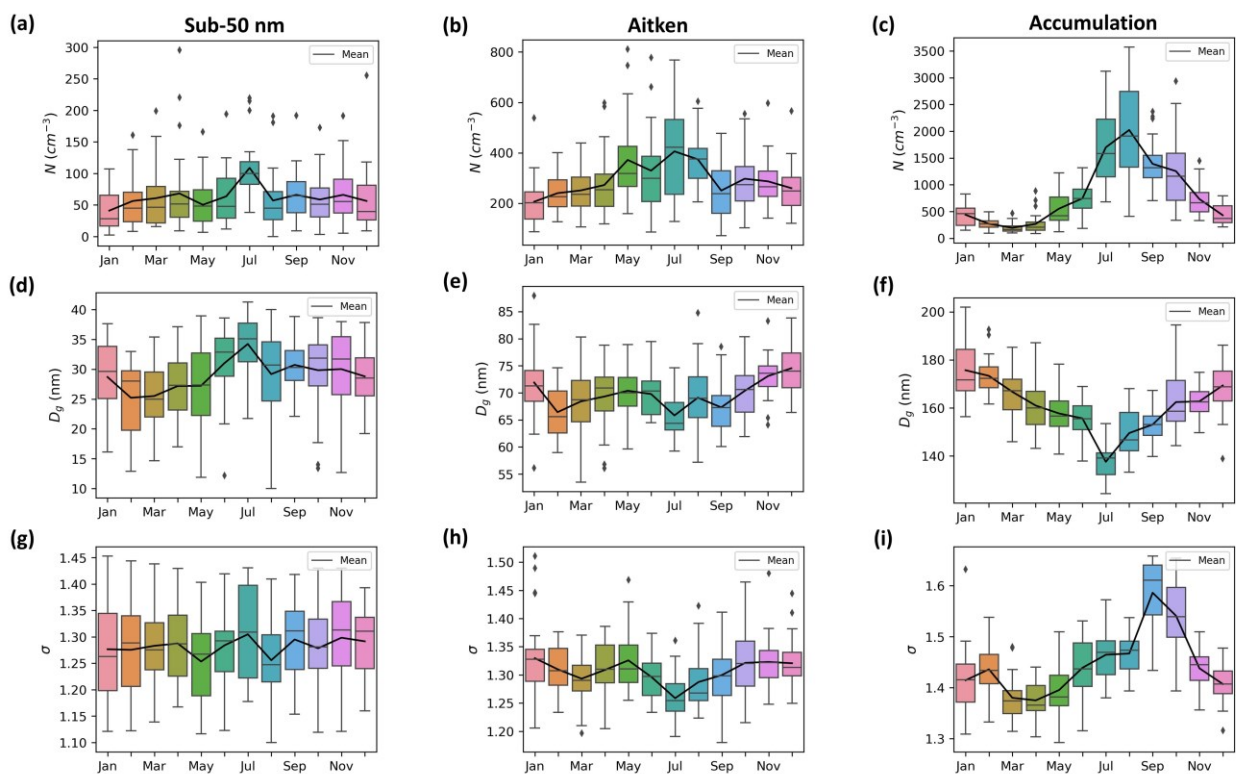
Figure S7. Monthly boxplot of each parameter of the multi-modal lognormal fit. The modes are shown in each column and the parameters number concentration (N), geometric diameter (D_g), and standard geometric deviation (σ) are in each row, respectively. The solid line represents the mean.
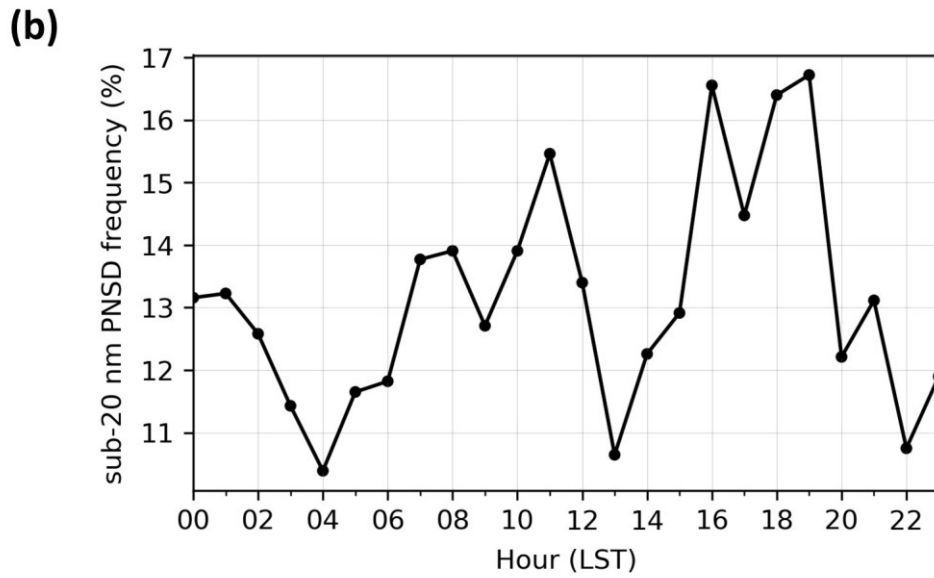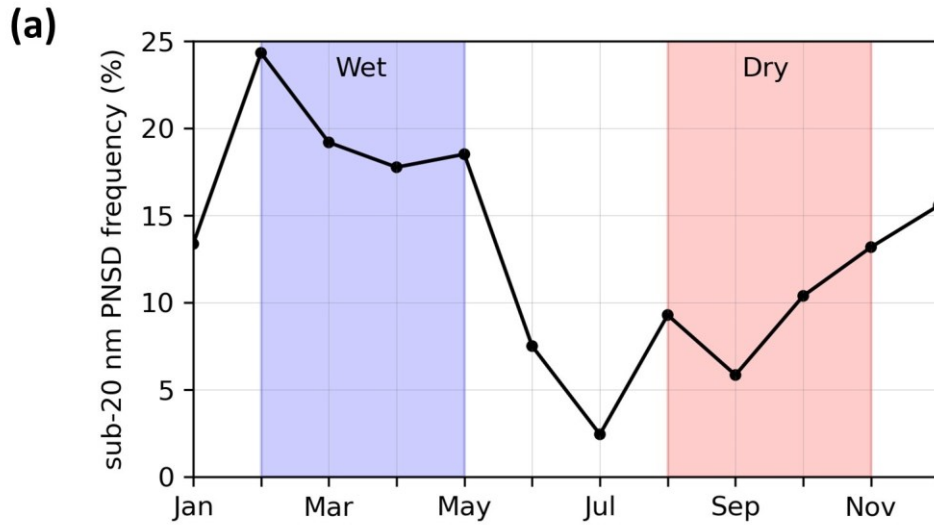
Figure S8. Frequency of occurrence of the sub-20 nm PNSDs. (a) Monthly frequency and (b) Hourly frequency. The frequency was computed considering all PNSDs of one year of data.