Atmospheric
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Discussions

Interactive comment on "Global analysis of continental boundary layer new particle formation based on long-term measurements" *by* Tuomo Nieminen et al.

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We thank the referee for the comments on our manuscript. Below we give our response to each of the comments and indicate the changes made to the manuscript (referee's comments are shown in italics and our response in normal type).

General comments
This manuscript made a well understanding of atmospheric NPF and its regional importance based on the measurements at 36 continental sites around the world. It gathered a valuable dataset of aerosol number concentration size distribution and would be interesting to the readers of ACP. I recommend this manuscript for publication in ACP

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with minor revisions.

Table 1: Please add more information of each site for the data representativeness evaluation. For instance, the ratio of valid data determination of each site's measurements in this research.
We added to Table 1 the percentage of days with available data between the start and end of the studied time period for each site. The modified Table 1 is shown below.

L484-485: This sentence is ambiguous. "NPF was most common (median of site-median NPF frequencies . . .and least common (less than 10%) during winter." According to the seasonal behavior of regional NPF contents in the manuscript, it would be better to replace "median of site-median NPF frequencies" with "site-median of seasonal-median NPF frequencies".
We agree with the referee: the NPF frequencies are indeed the median of all sites' seasonal-median values. We revised the sentence as "NPF was most common (site-median of seasonal-median NPF frequencies of about 30%) during the northern hemisphere spring and least common (less than 10%) during winter."

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	Station name and abbreviation		Environment	Coordinates	Altitude (m a.s.l.)	Time period	Data coverage (%)	Instrument	Size range (nm)
1	Mt. Zeppelin, Norway	ZPL	polar	78° 56' N, 11° 53' E	474	2005–2013	91	DMPS	10–800
2	Dome-C, Antarctica	DMC	polar	75° 6' S, 123° 23' E	3200	2007–2009	77	DMPS	10–620
3	Alert, Canada	ALE	polar	82° 28' N, 62° 30' W	75	2012–2014	96	SMPS	10–470
4	Jungfraujoch, Switzerland	JFJ	high-altitude	46° 33' N, 7° 59' E	3580	2008–2009	87	SMPS	12–820
5	Puy de Dome, France	PDD	high-altitude	45° 46' N, 2° 57' E	1465	2008–2009	92	SMPS	3–1000
6	Pico Espejo, Venezuela	PIC	high-altitude	8° 30' N, 71° 6' W	4775	2007–2009	86	DMPS	10–470
7	Mukteshwar, India	MUK	high-altitude	29° 26' N, 79° 37' E	2180	2005–2014	87	DMPS	10–750
8	Mt. Waliguan, China	WLG	remote	36° 17' N, 100° 54' E	3816	2005–2007	68	DMPS	10–500
9	Finokalia, Greece	FKL	remote	35° 18' N, 25° 42' E	235	2008–2012	76	SMPS	9–800
10	Mace Head, Ireland	MHD	remote	53° 12' N, 9° 48' W	10	2005–2009	87	SMPS	8–470
11	Värriö, Finland	VÄR	remote	67° 45' N, 29° 36' E	390	1997–2016	94	DMPS	3–860
12	Pallas, Finland	PAL	remote	67° 58' N, 24° 7' E	565	2005–2014	82	DMPS	5–470
13	Abisko, Sweden	ABI	remote	68.35°N, 19.05°E	380	2005–2007	49	SMPS	10–570
14	Tiksi, Russia	TKS	remote	71° 36' N, 128° 53' E	10	2010–2012	76	DMPS	7–500
15	Hyytiälä, Finland	HYY	rural	61° 51' N, 24° 17' E	181	1996–2016	96	DMPS	3–1000
16	Aspvreten, Sweden	ASP	rural	58° 48' N, 17° 24' E	25	2006–2013	94	DMPS	10–470
17	Preila, Lithuania	PRL	rural	55° 24' N, 21° 0' E	10	2009–2013	59	SMPS	8–850
18	Tomsk, Russia	TMK	rural	56°25' N, 84°4' E	145	2011–2013	92	DPS	3–200
19	Järvselja, Estonia	JRV	rural	56° 16' N, 27° 16' E	36	2012–2016	79	EAS	3–1000
20	Hohenpeissenberg, Germany	HPB	rural	47° 48' N, 11° 1' E	988	2008–2015	91	SMPS	10–800
21	Vavihill, Sweden	VHL	rural	56° 1' N, 13° 9' E	172	2008–2015	84	DMPS	3–900
22	K-Puszta, Hungary	KPZ	rural	46° 58' N, 19° 33' E	125	2008–2014	78	DMPS	6–800
23	Melpitz, Germany	MPZ	rural	51° 32' N, 12° 54' E	87	2008–2015	87	DMPS	5–800
24	San Pietro Capofiume, Italy	SPC	rural	44° 39' N, 11° 37' E	11	2002–2016	78	DMPS	3–630
25	Cabauw, Netherlands	CBW	rural	51° 18' N, 4° 55' E	60	2008–2009	88	SMPS	9–520
26	Harwell, UK	HRW	rural	51° 34' N, 1° 19' W	60	2006	86	SMPS	12–440
27	Egbert, Canada	EGB	rural	44° 14' N, 79° 47' W	251	2007–2008	93	SMPS	10–400
28	Southern Great Plains, US	SGP	rural	36° 36' N, 97° 29' W	300	2011–2014	91	DMPS	12–740
29	Botsalano, South Africa	BOT	rural	25° 32' S, 27° 75' E	1400	2006–2008	80	DMPS	11–840
30	Welgegund, South Africa	WGD	rural	26° 34' S, 26° 56' E	1480	2010–2011	97	DMPS	11–840
31	Marikana, South Africa	MAR	urban	25° 42' S, 27° 29' E	1170	2008–2010	84	DMPS	11–840
32	Helsinki, Finland	HEL	urban	60° 12' N, 24° 58' E	26	2005–2016	96	DMPS	3–1000
33	Beijing, China	BEI	urban	40° 0' N, 116° 19' E	50	2004	61	DMPS	3–1000
34	Nanjing, China	NAN	urban	32° 7' N, 118° 57' E	25	2011–2013	88	DMPS	6–800
35	Budapest, Hungary	BUD	urban	47° 29' N, 19° 4' E	115	2008–2013	95	DMPS	6–1000
36	Sao Paulo, Brazil	SPL	urban	23° 34' S, 46° 44' W	750	2010–2011	85	DMPS	6–800

Fig. 1. Modified Table 1 (column on data coverage added).

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