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Supplement of

Influence of covariance of aerosol and meteorology on co-located precipitating and non-precipitating clouds over the Indo-Gangetic Plain

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Table 1S. Decadal percentage variations in average values of AOD over the eastern part of IGP

	Kolkata	Dhaka	Patna
Total number of counts	1976	2018	2629
Decadal change in AOD	18%	22.6%	23.3%

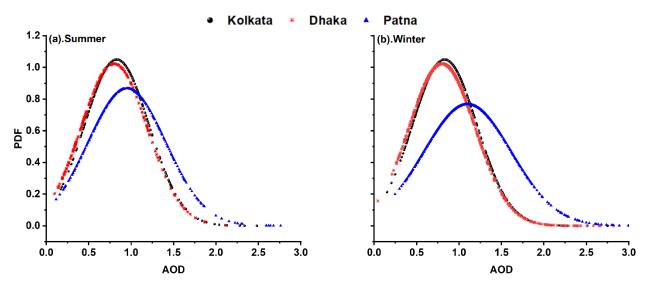


Figure 1S. The probability density function (PDF) of AOD over study sites is shown (a) and (b) for the summer and winter seasons respectively.

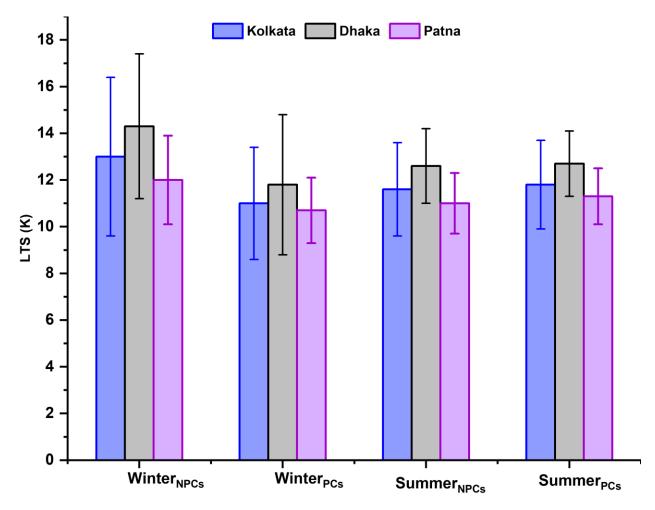


Figure 2S. Variations in lower tropospheric stability (LTS) over all study sites for PCs and NPCs in winter and summer seasons, the error bars show the standard deviation (SD) values

Table 2S. Meteorological parameters for PCs(NPCs) in summer and winter seasons. Maximum values are for both types of clouds shown in bold and minimum values are indicated in italics.

		Winter Season			Summer Season	
	T850 (K)	RH%	ω (m/s)	T850 (K)	RH%	ω (m/s)
Kolkata	286.7 (286)	47.4 (39.9)	-0.002 (0.08)	295.5 (295)	74.8 (72.8)	-0.15 (-0.14)
Dhaka	285.8 (285.3)	48.5 (49.2)	0.04 (0.08)	294.5 (294.4)	76.5 (74.6)	-0.13 (-0.10)
Patna	284.7 (284.3)	64.6 (55.8)	-0.06 (0.05)	295.3 (297.3)	88.8 (83.5)	-0.19 (-0.17)

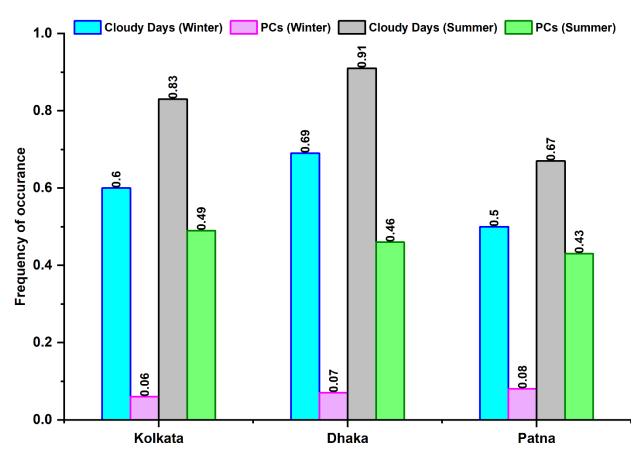


Figure 3S. The frequency of occurrence of total cloudy days (including PCs and NPCs) and only PCs is shown for both winter and summer seasons.

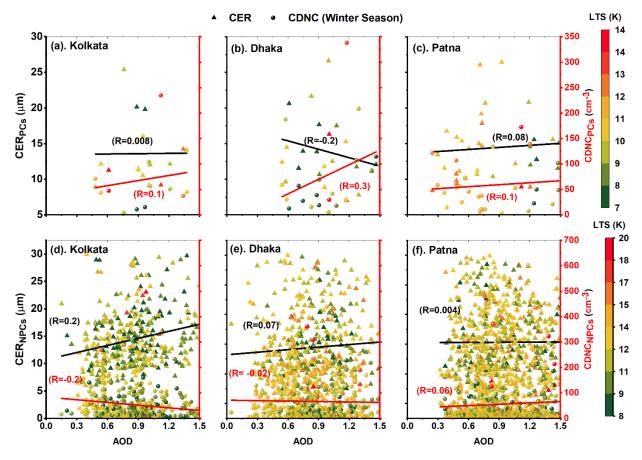


Figure 4S. AOD-CER and AOD-CDNC correlation coefficient for PCs and NPCs over all study areas in the winter season.

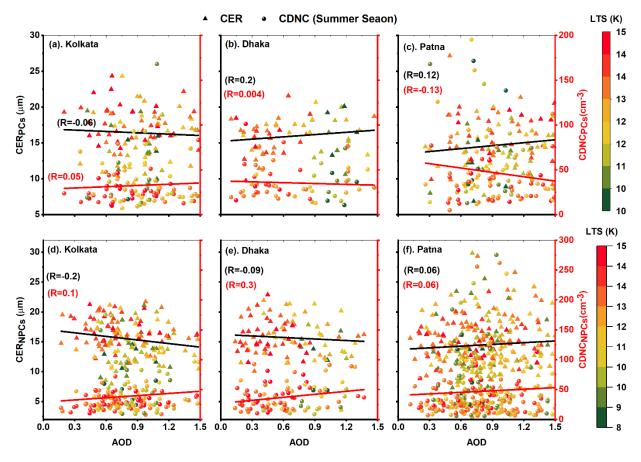


Figure 5S. Same as Figure 4S but in the summer season.

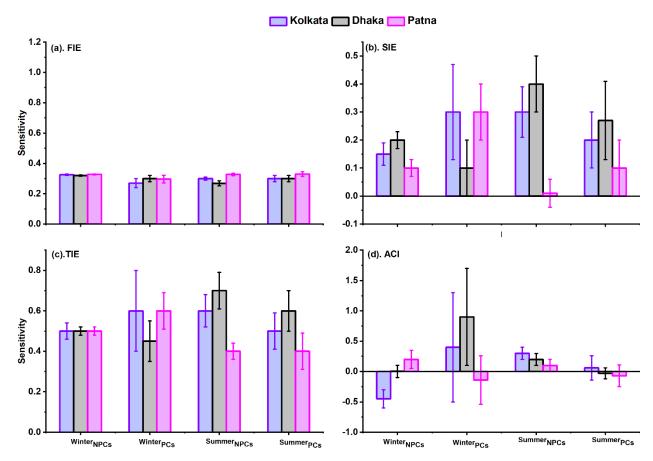


Figure 6S. The sensitivity matrices estimated for aerosol-cloud relationship using CDNC are shown in (a) FIE, (b) SIE, (c) TIE, and (d) ACI.

Table 3S. Number of data points for each regime

	os, rumoer er e	Karachi Winter			Lahore Winter (NPCs)			Delhi Winter (NPCs)			Kanpur Winter			Jaipur Winter			Gandhi College Winter (NPCs)		
			(NPCs	s)	Lahore	e Winter	(NPCs)	Delhi	Winter (N	PCs)		(NPCs))		(NPC	(s)	W	inter (NI	Cs)
⁵ a)	440 to <180	35	29	11	27	19		19	17		22	16		29	19		16	19	
CTP (hPa)	680-440	60	63	19	<i>7</i> 9	34		66	42	16	50	31	15	74	35	20	29	18	
	<800 to 680	570	107	18	293	183	21	357	258	22	438	228	20	376	173	48	380	92	17
		Karacı	Karachi Winter (PCs) LahoreWinter (PCs)			Delhi Winter (PCs)		Kanpur Winter (PCs)			Jaipur Winter (PCs)			Gandhi College Winter (PCs)					
				, , ,					Ì	ĺ				1				,	,
hPa)	440 to <180	17	15		17	16	18	19	16	15	17	16			19		20	17	
CTP (hPa)	680-440	23	22	16	23	43	22	20	21	18	17	15	20	17	15	18	19	15	19
C	<800 to 680	27	23		60	53	27	26	34	22	27	16		33	26	22	33	35	16
		Kar	achi Su (NPCs		Lahore Summer (NPCs)			Delhi Summer (NPCs)		Kanpur Summer (NPCs)			Jaipur Summer (NPCs)			Gandhi College Summer (NPCs)			
a)	440 to <180	52	76		38	99	19	43	69	15	43	43	15	81	122	20	44	49	16
CTP (hPa)	680-440	29	133		55	136	21	54	80	18	52	51	18	38	90	15	24	40	20
\mathcal{S}	>800 to 680	162	400		155	164		110	66	41	91	64	27	27	82	17	44	34	
		Kar	achi Su (PCs)		Lahore Summer (PCs)		Delhi Summer (PCs)		Kanpur Summer (PCs)		Jaipur Summer (PCs)			Gandhi College Summer (PCs)					
(a)	440 to <180	24	19		26	63	16	24	68	21	18	50	16	16	25	15	35	76	20
CTP (hPa)	680-440		21		31	88	20	39	71	34	17	54	22	19	24	20	23	47	17
CI	<800 to 680	31	33		62	86		42	45		26	23		15	22	16	29	40	
		0-3.6	3.6-23	23 to >60	0-3.6	3.6-23	23 to >60	0-3.6	3.6-23	23 to >60	0-3.6	3.6-23	23 to >60	0-3.6	3.6-23	23 to >60	0-3.6	3.6-23	23 to >60
			СОТ	,	COT		СОТ		COT		СОТ			СОТ					