Supplement of
A dataset of ground-based vertical profile observations of aerosol, NO2 and HCHO from the hyperspectral vertical remote sensing network in China (2019-2023)

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Table S1. The Sites location and their corresponding nearest China National Environmental Monitoring Center (CNEMC) stations.

	MAX-DOAS stations			The nearest CNEMCs		Distance (km)
No.	Station(code)	Longitude(°E)	Latitude(°N)	Longitude(°E)	Latitude(°N)	
1	CAMS	116.32	39.94	116.34	39.93	2.52
2	IAP	116.37	39.97	116.40	39.98	1.92
3	NC	116.12	39.78	116.15	39.82	4.95
4	UCAS	116.67	40.40	116.63	40.33	9.80
5	WD	115.15	38.17	114.85	38.03	30.38
6	XH	116.97	39.76	117.30	39.72	28.58
7	SJZ	114.60	37.90	114.64	37.90	2.94
8	SXU	112.58	37.63	112.56	37.74	12.09
9	IMNU	111.68	40.80	111.66	40.80	2.52
10	DY	118.98	37.76	118.57	37.57	42.01
11	QD	120.67	36.34	120.61	36.44	11.54
12	TS	117.10	36.25	117.09	36.20	6.11
13	TA	117.06	36.20	117.09	36.20	2.49
14	SH_XH	121.43	31.17	121.41	31.17	2.11
15	SH_DL	120.97	31.09	120.98	31.09	0.02
16	NUIST	118.71	32.20	118.81	32.11	14.16
17	NB	121.89	29.75	121.84	29.91	18.60
18	HNI	122.67	30.86	121.80	31.05	86.33

19	LA	119.75	30.30	119.72	32.24	7.43
20	HNU	116.80	33.98	116.80	33.98	1.03
21	AHU	117.18	31.77	117.20	31.78	1.80
22	CF	117.18	32.21	117.27	31.94	30.59
23	IUE	118.05	24.61	118.10	24.57	6.03
24	GIG	113.35	23.15	113.32	23.13	4.23
25	SUST	113.99	22.59	114.03	22.62	4.22
26	SLS	99.72	28.00	99.71	27.83	19.61
27	CQ	106.50	29.60	106.46	29.57	5.57
28	LZU	103.85	36.04	103.83	36.05	2.10
29	XA	109.09	34.52	109.00	34.26	1.04
30	JHI	120.77	40.47	120.83	40.71	26.25
31	LNU	123.04	41.81	123.40	41.79	1.64
32	LY	112.45	34.67	112.44	34.67	1.58

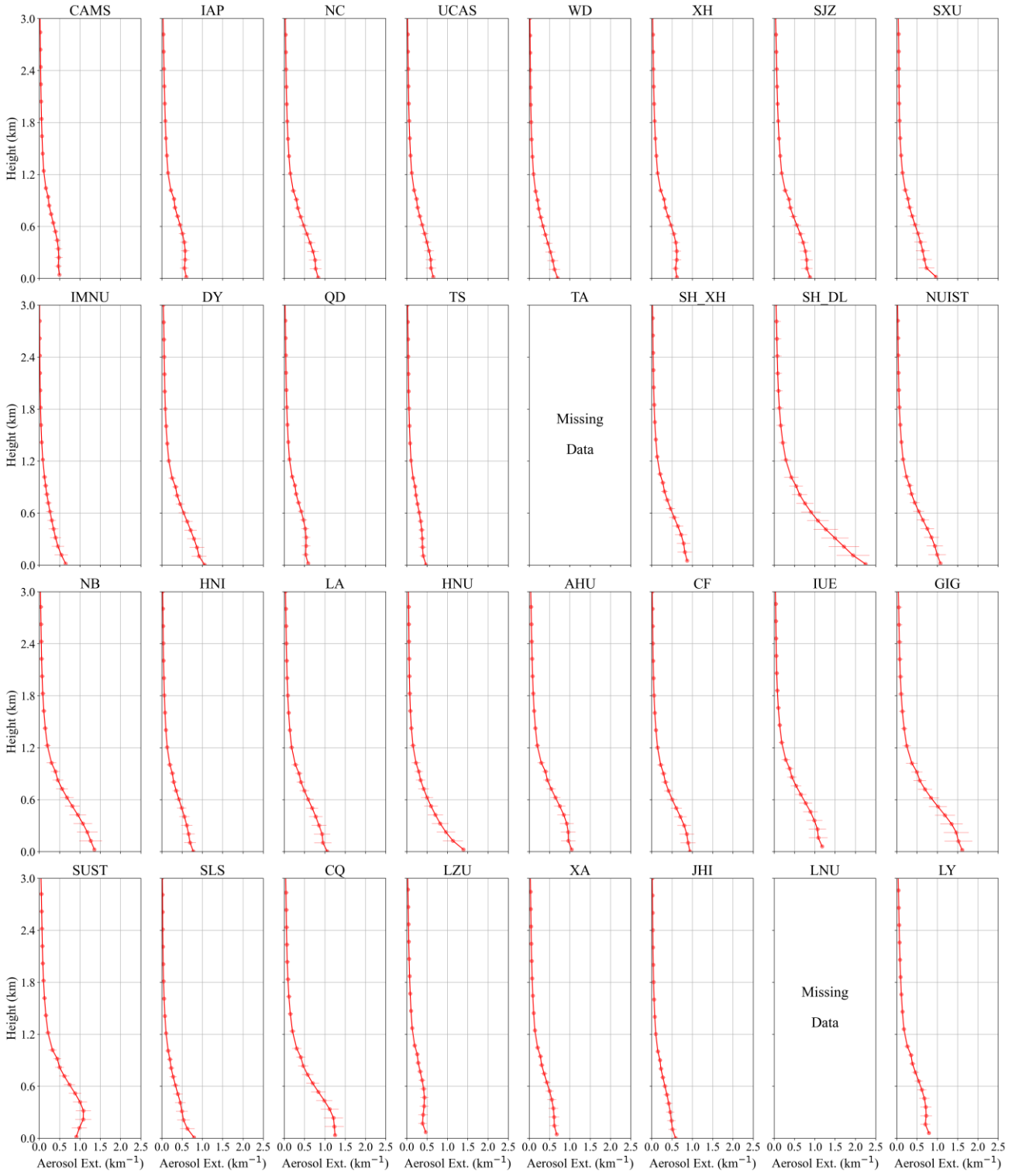


Figure S1. Spring averaged aerosol extinction vertical profiles during 2019-2023.

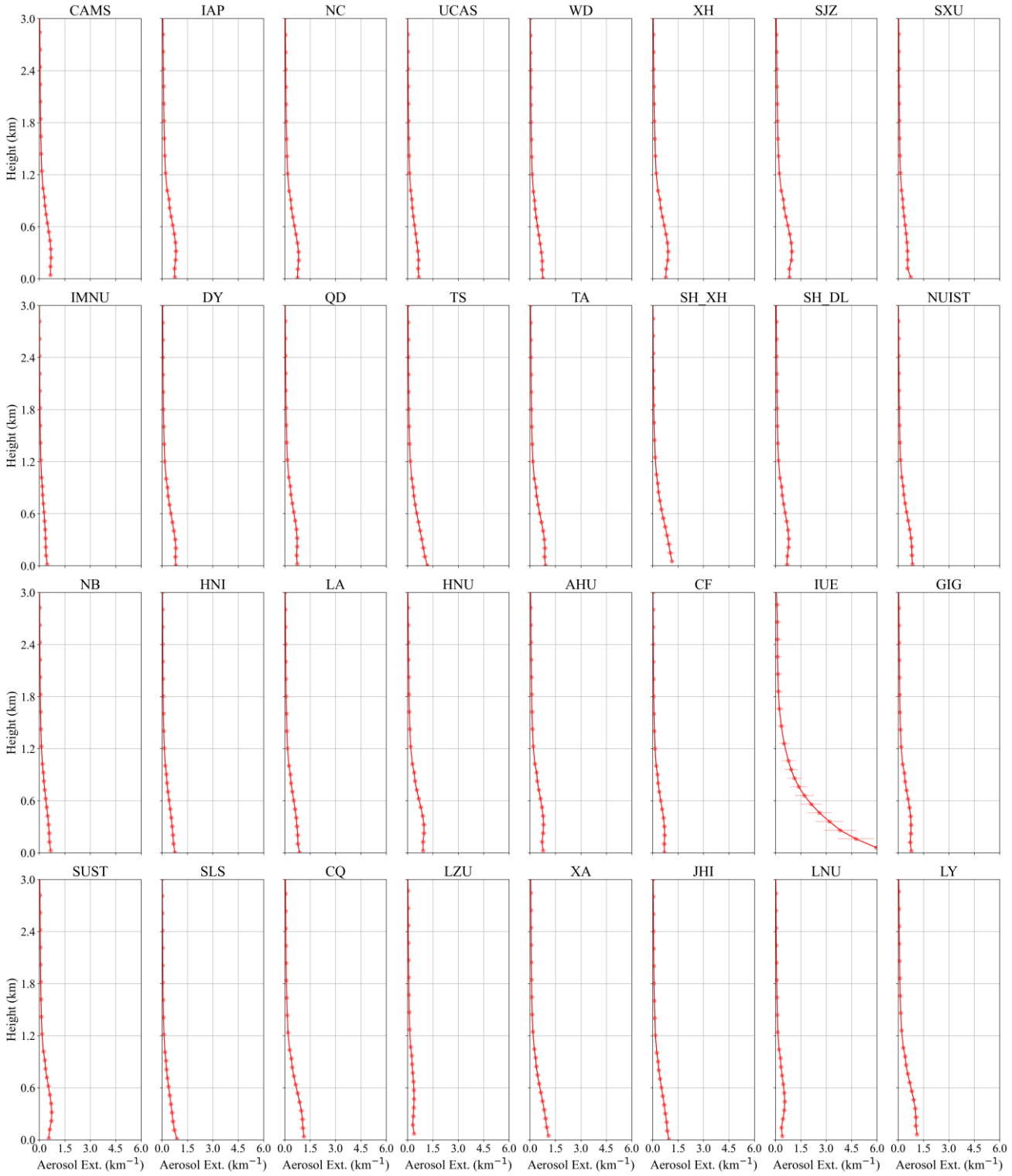


Figure S2. Summer averaged aerosol extinction vertical profiles during 2019-2023.

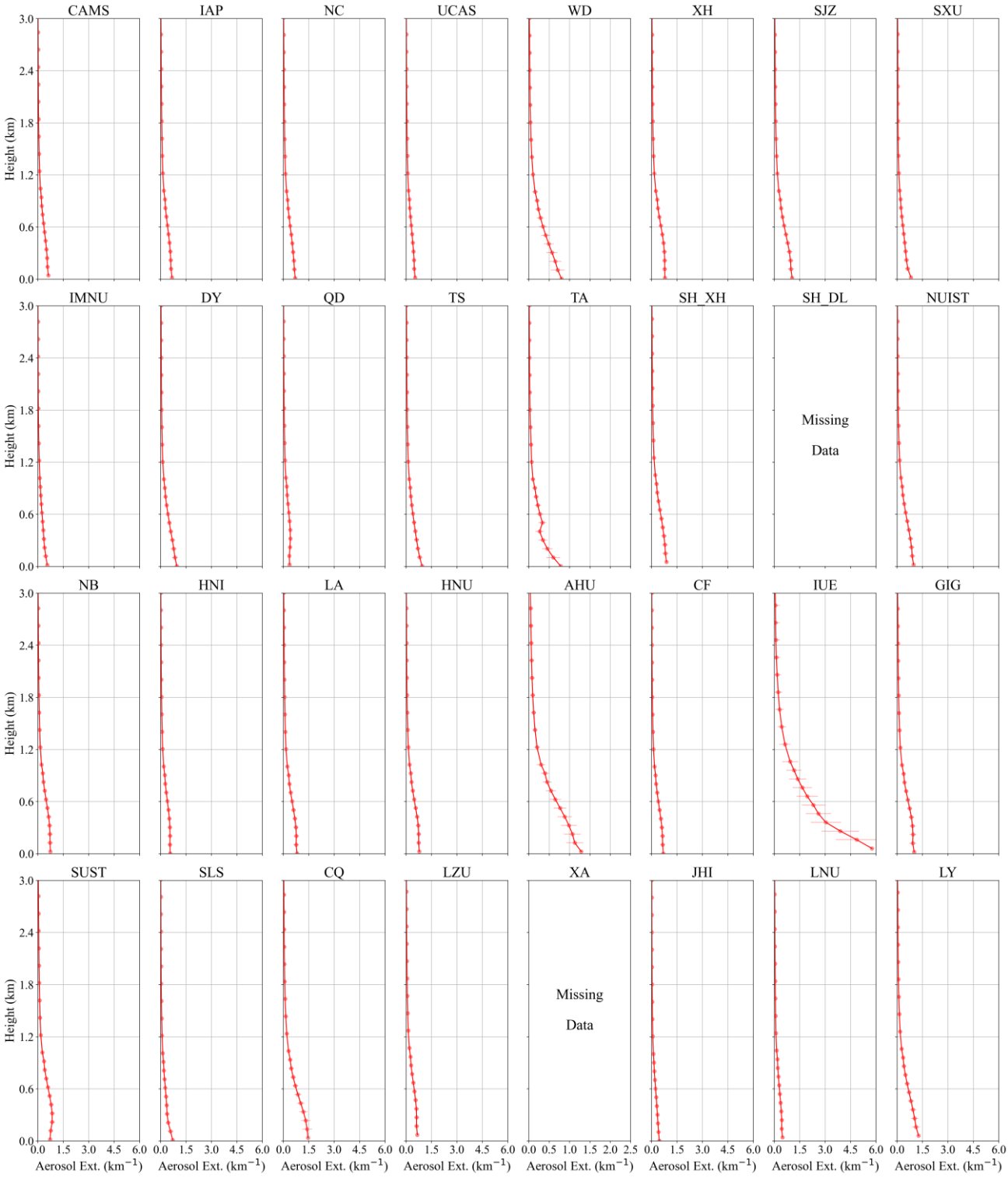
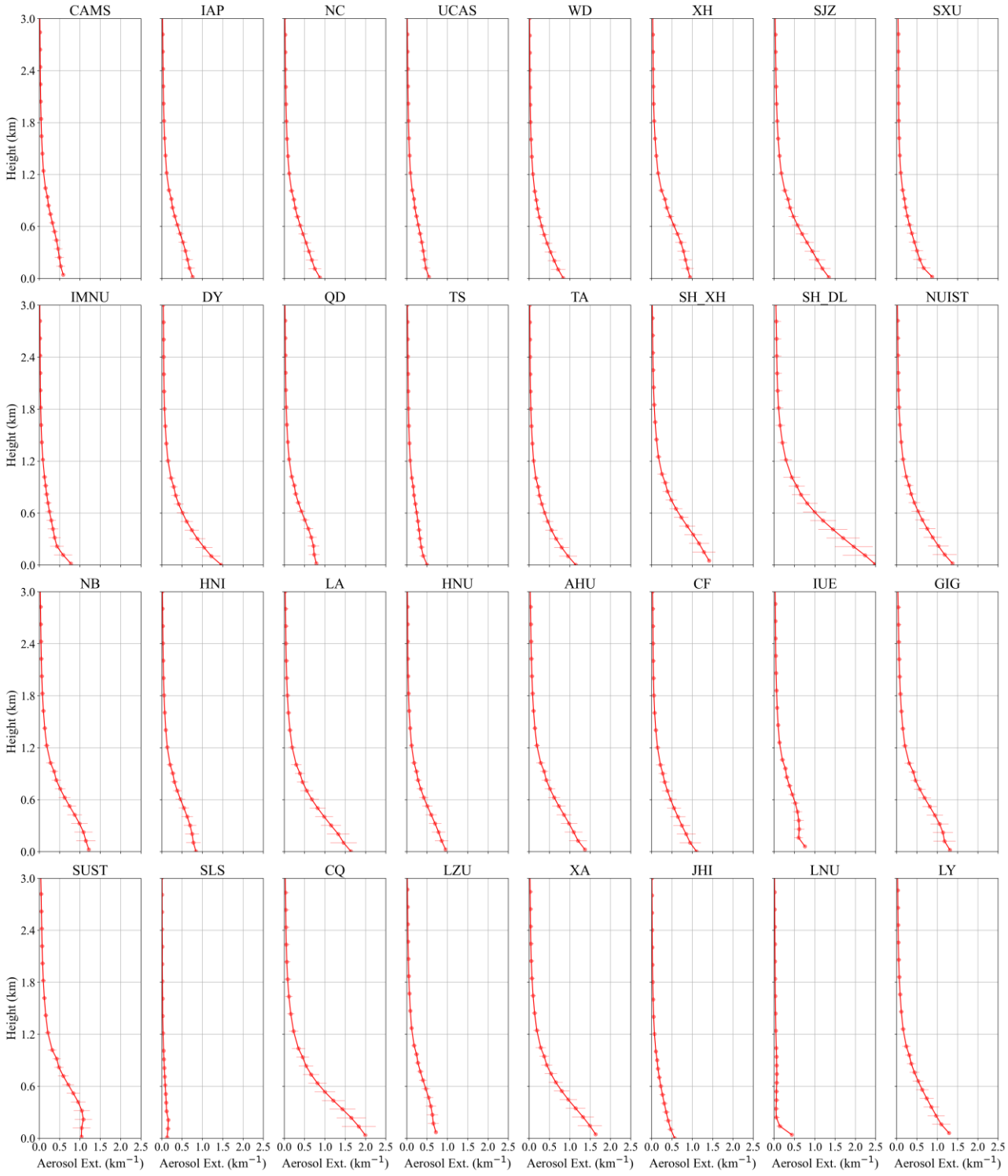


Figure S3. Autumn averaged aerosol extinction vertical profiles during 2019-2023.



30 **Figure S4. Winter averaged aerosol extinction vertical profiles during 2019-2023.**

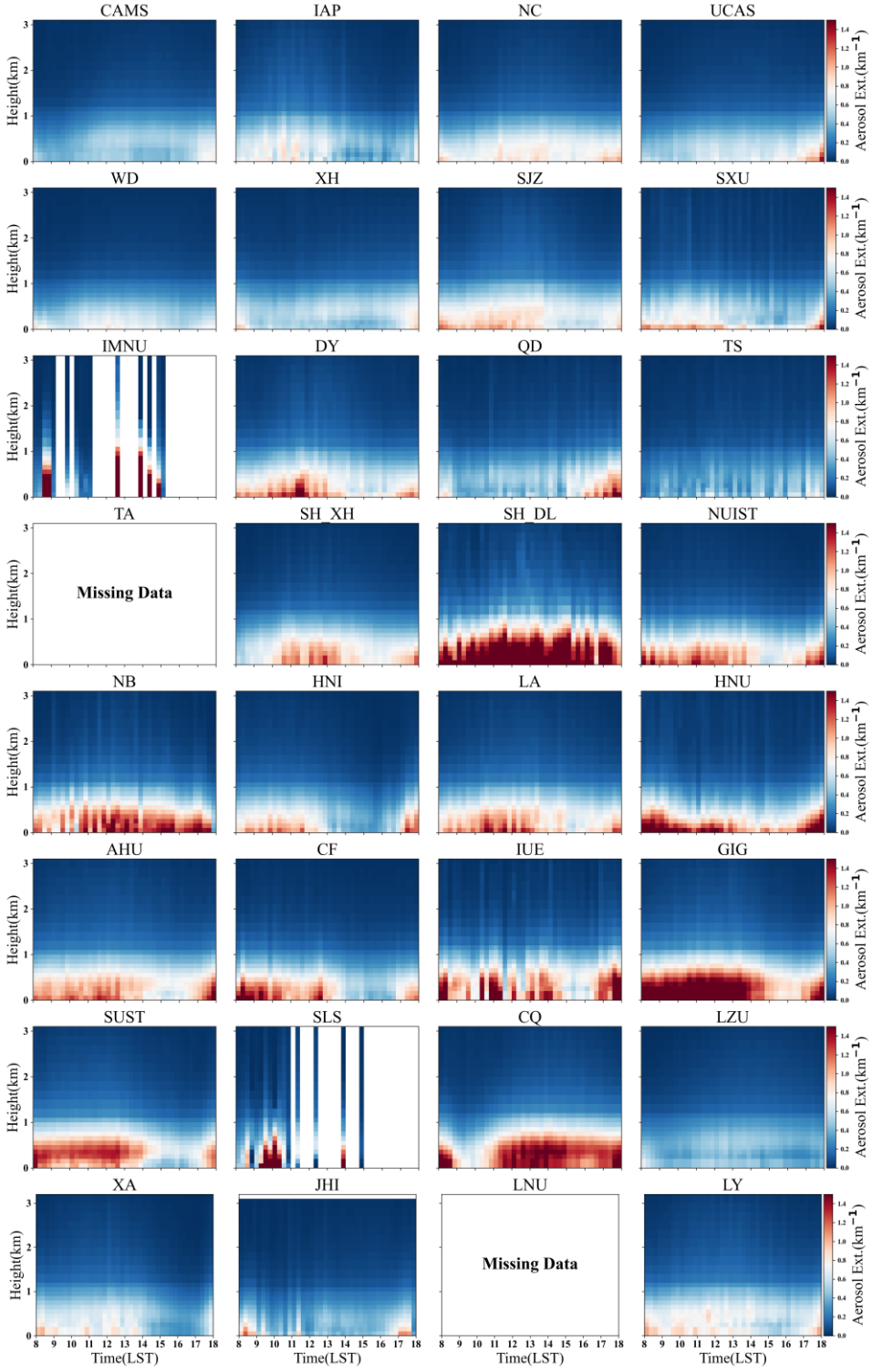


Figure S5. Diurnal variation of the spring averaged aerosol extinction vertical profiles during 2019-2023.

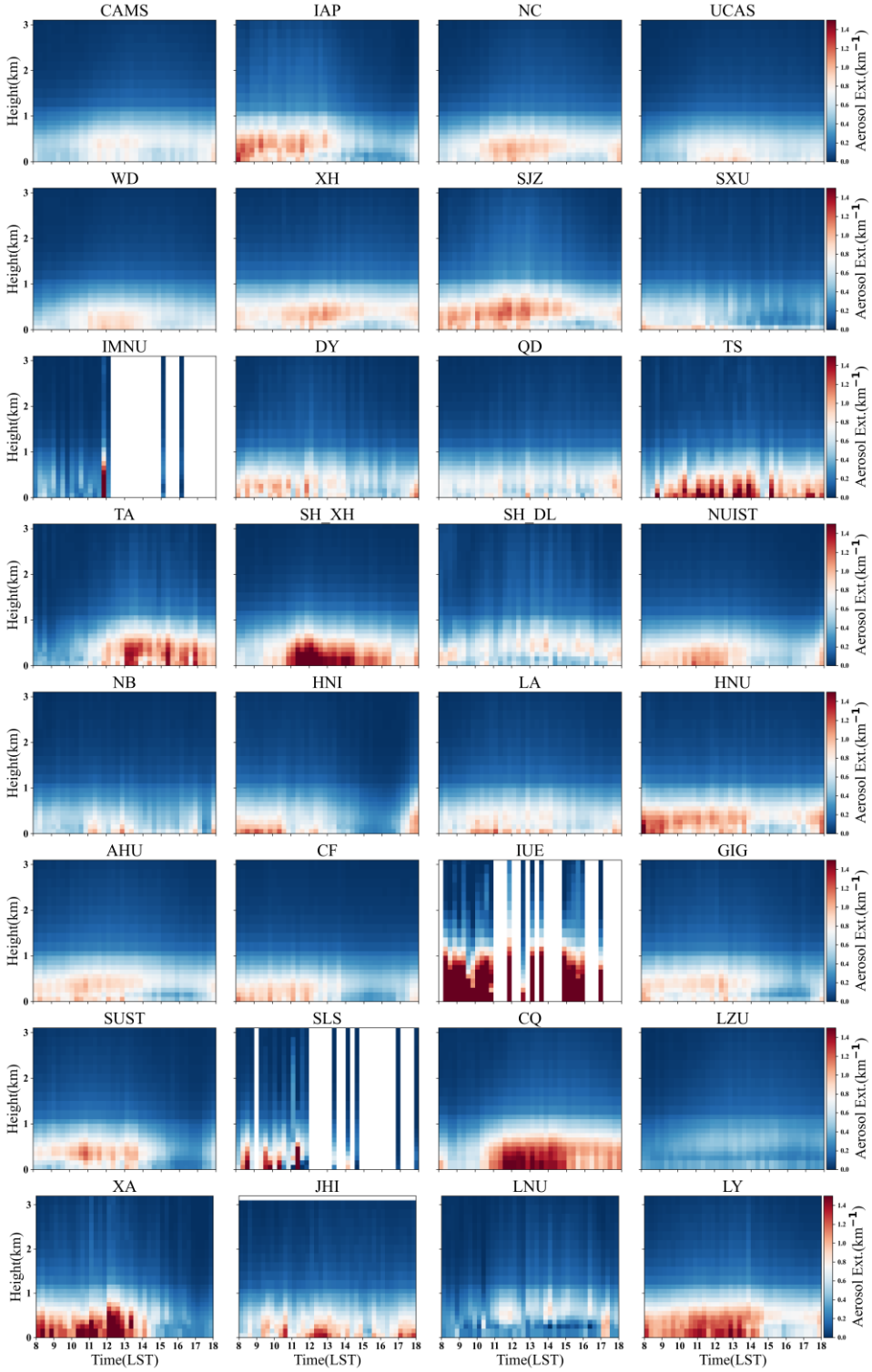


Figure S6. Diurnal variation of the summer averaged aerosol extinction vertical profiles during 2019-2023.

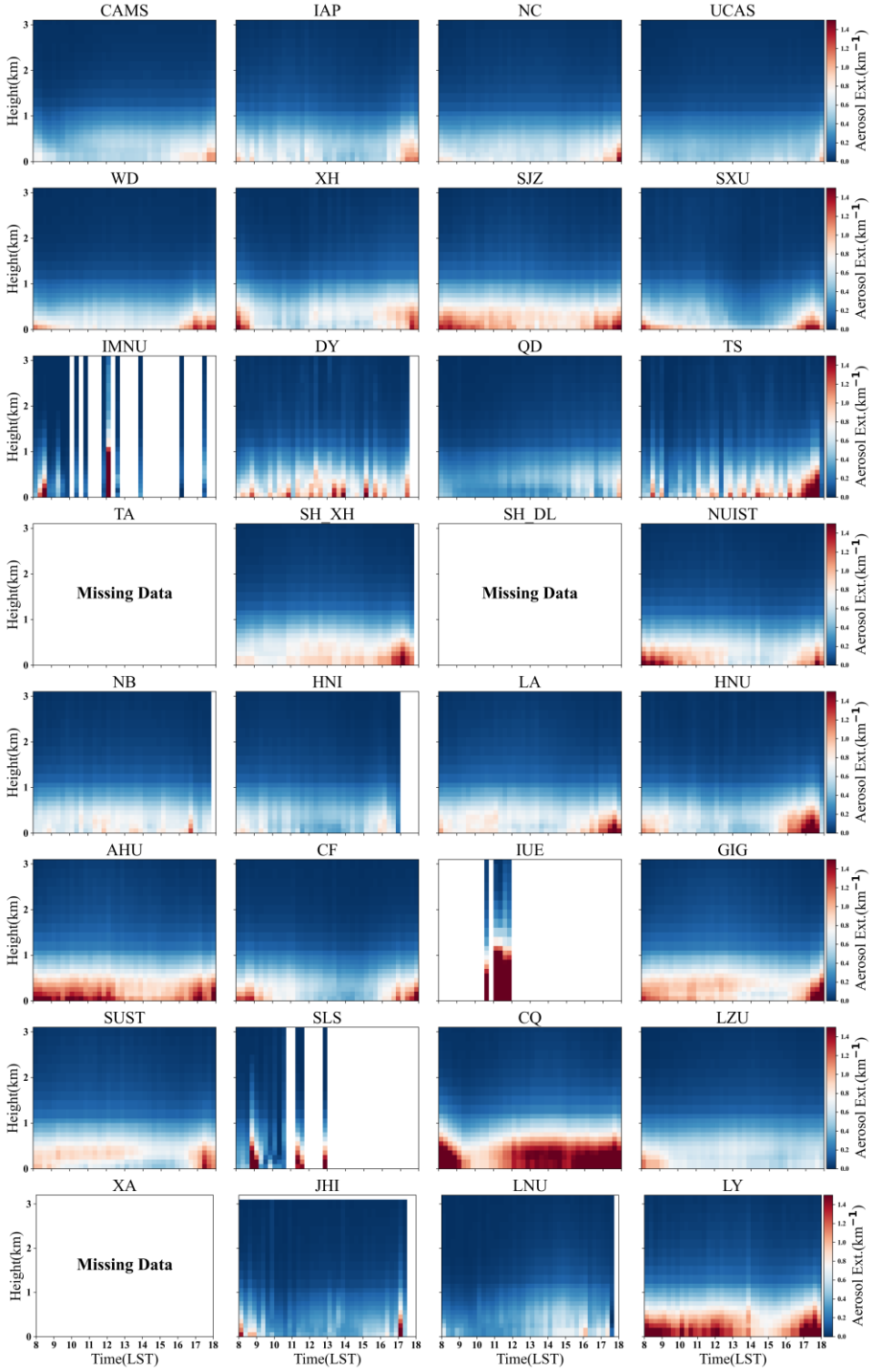


Figure S7. Diurnal variation of the autumn averaged aerosol extinction vertical profiles during 2019-2023.

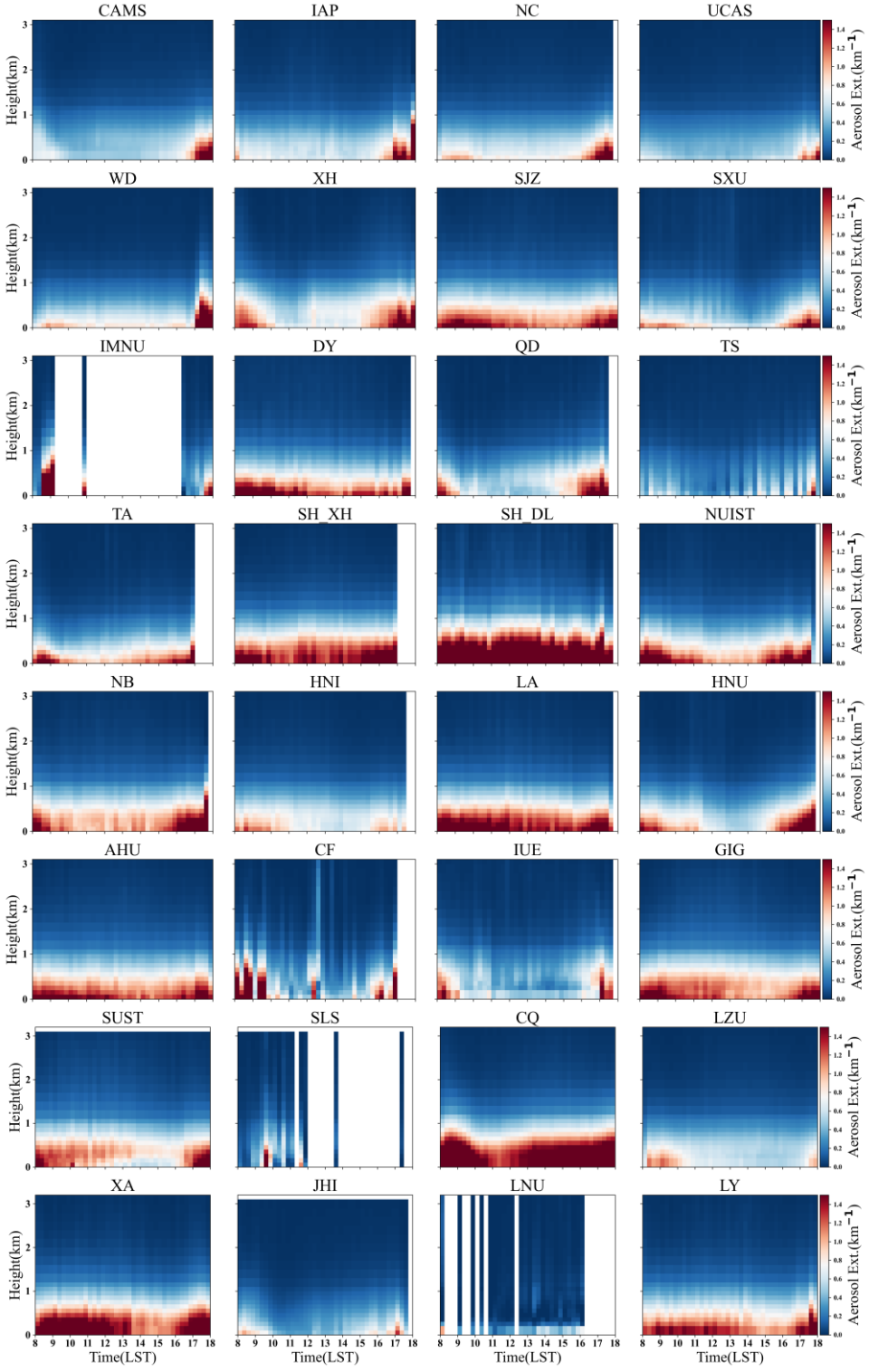


Figure S8. Diurnal variation of the winter averaged aerosol extinction vertical profiles during 2019-2023.

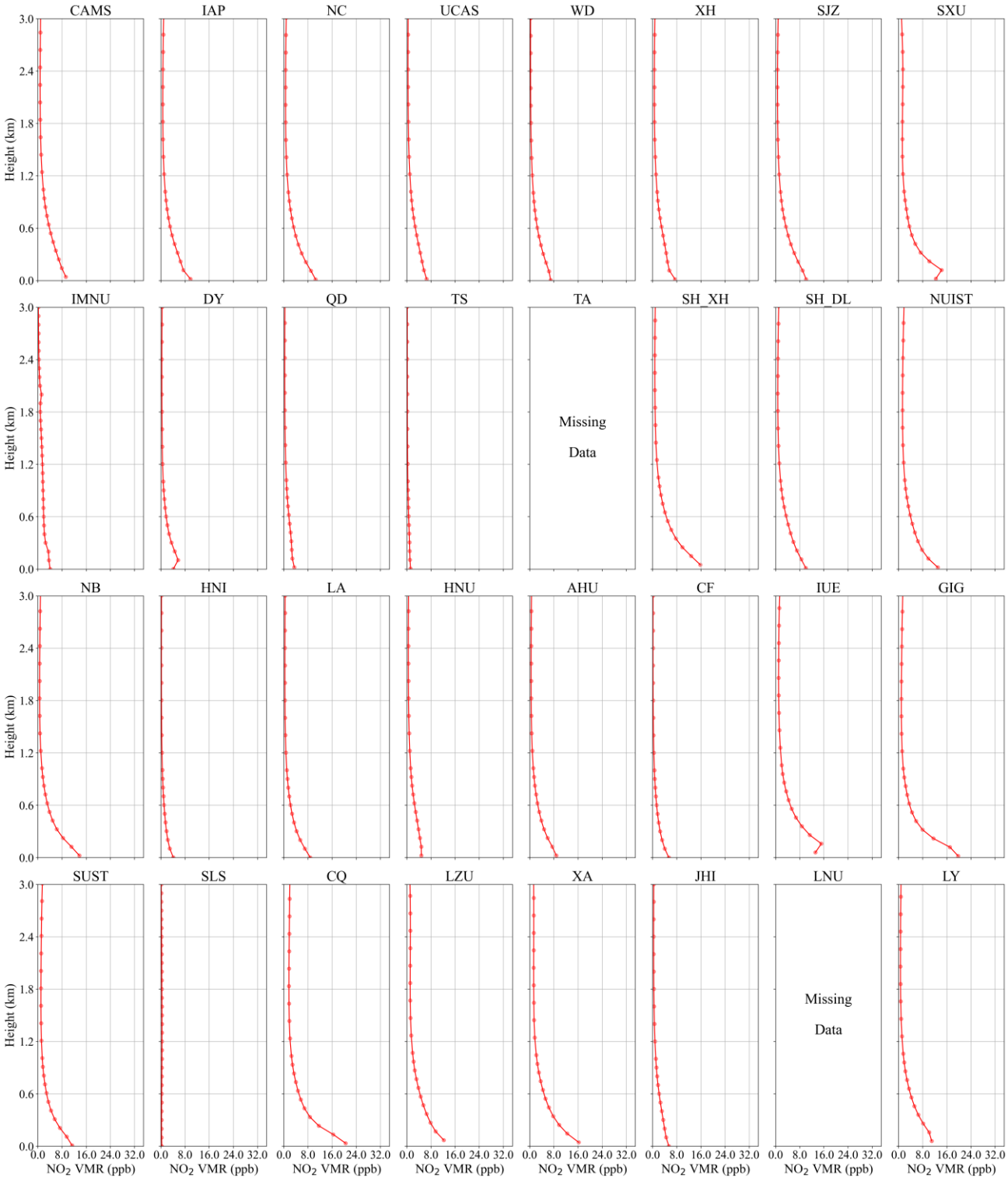


Figure S9. Spring averaged NO2 vertical profiles during 2019-2023.

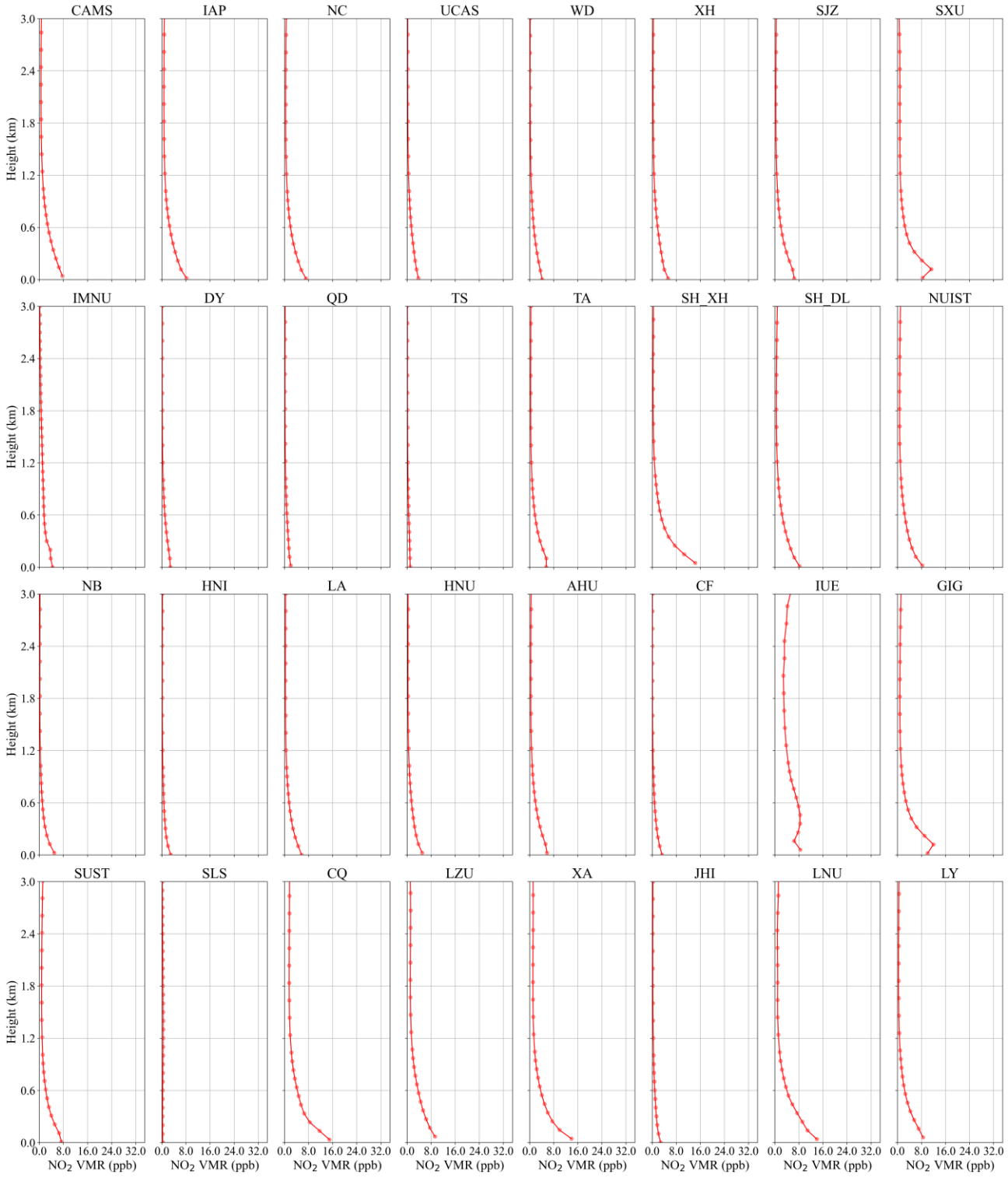


Figure S10. Summer averaged NO2 vertical profiles during 2019-2023.

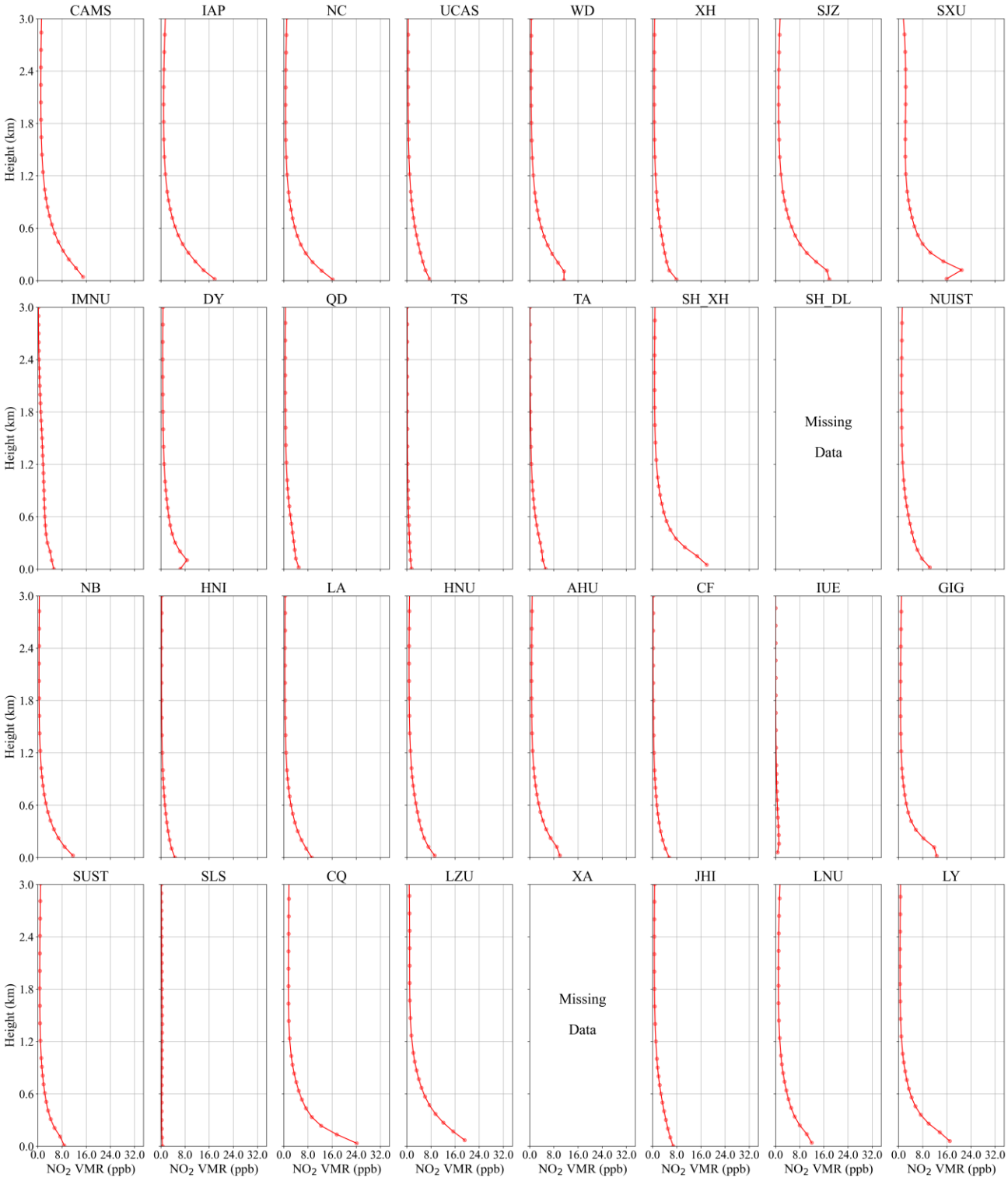


Figure S11. Autumn averaged NO2 vertical profiles during 2019-2023.

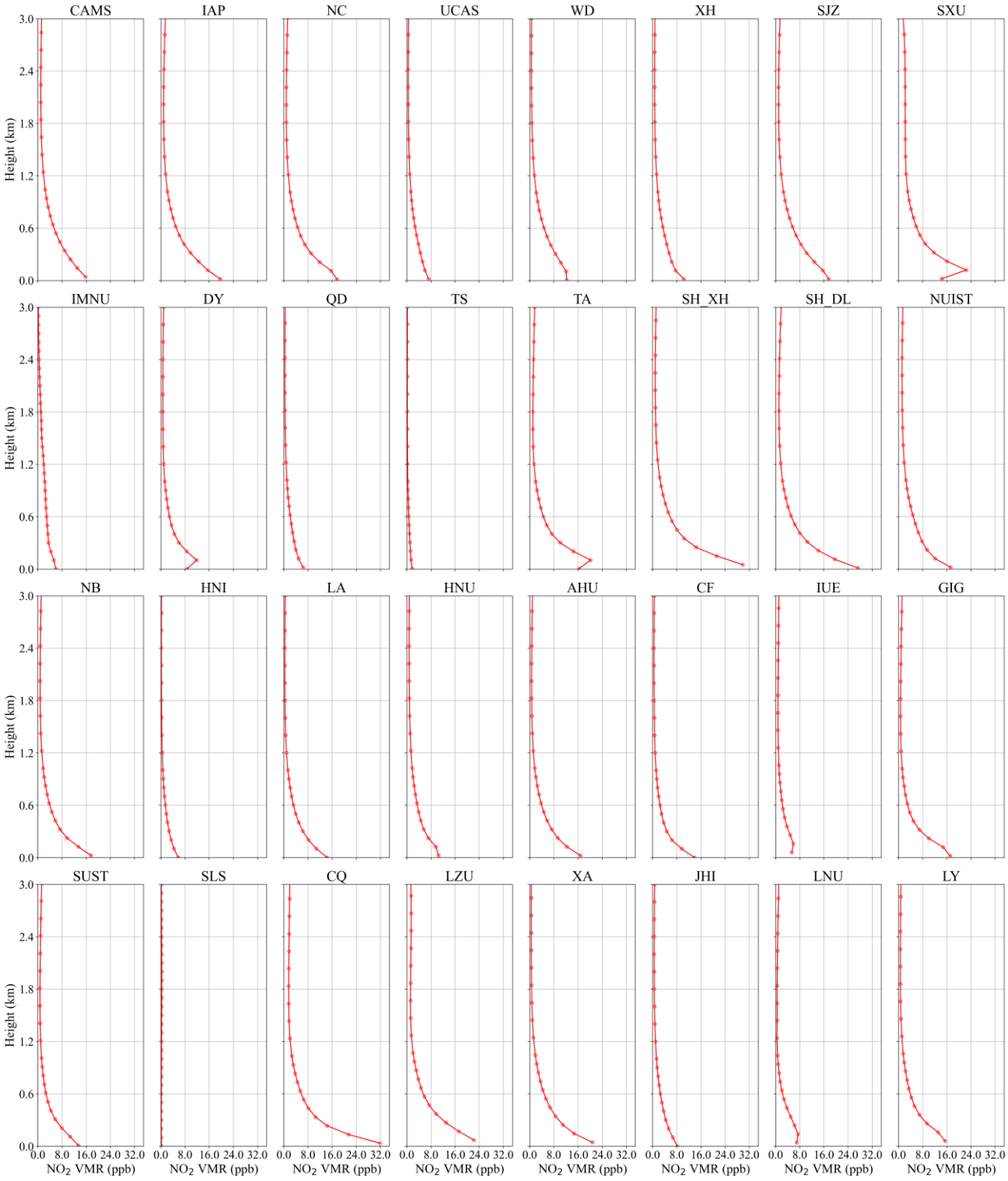


Figure S12. Winter averaged NO2 vertical profiles during 2019-2023.

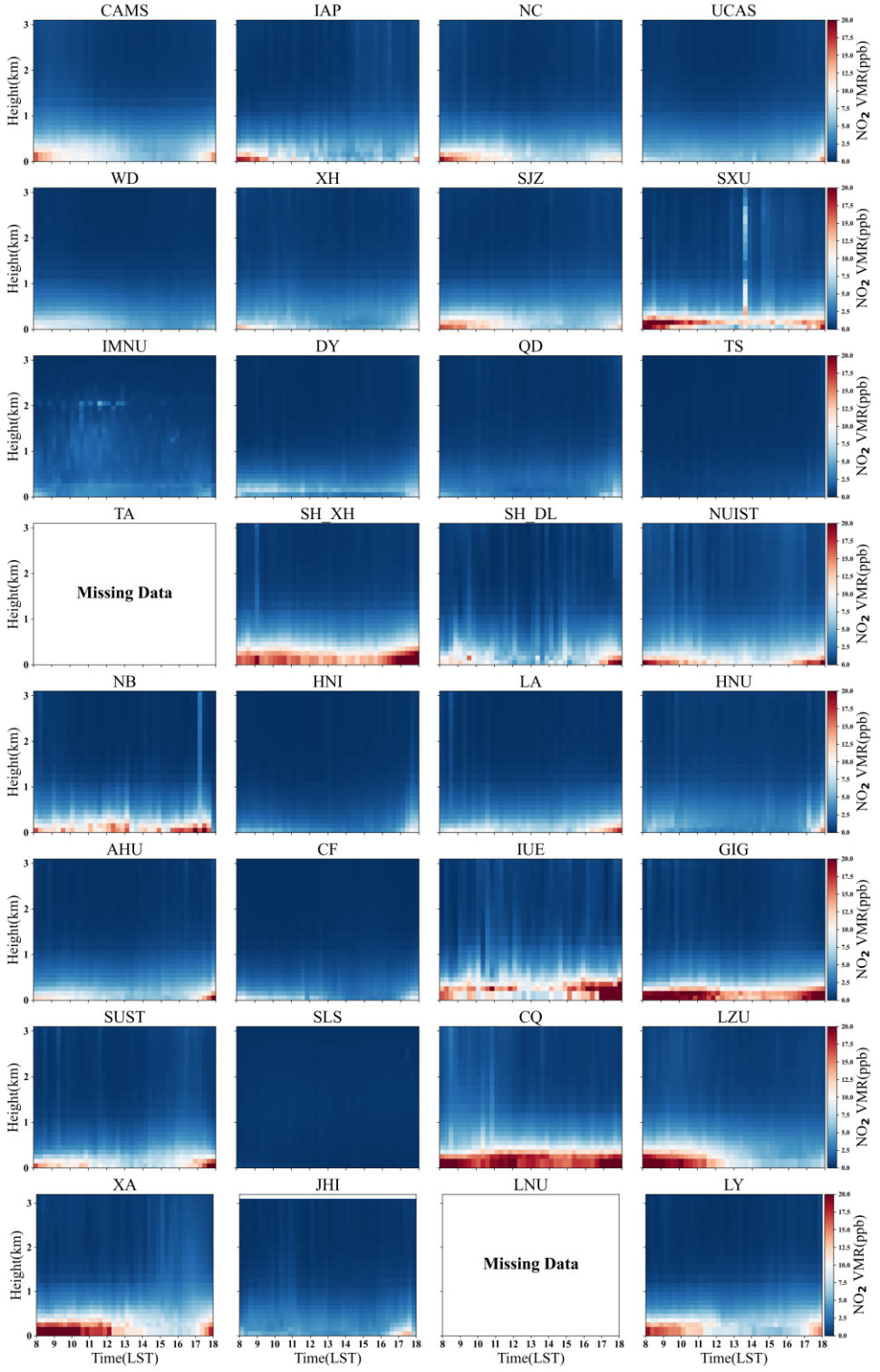


Figure S13. Diurnal variation of the spring averaged NO2 vertical profiles during 2019-2023.

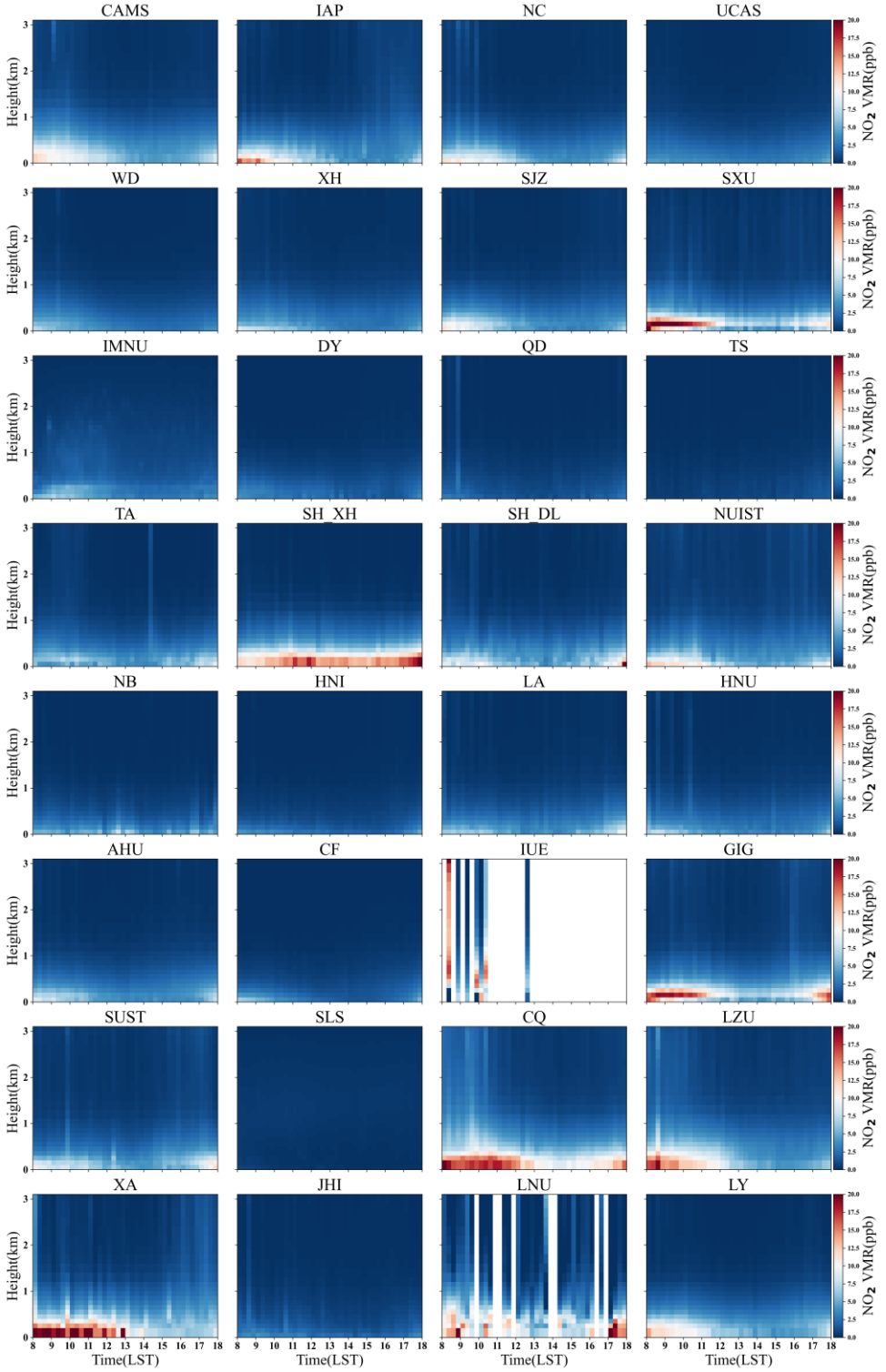


Figure S14. Diurnal variation of the summer averaged NO2 vertical profiles during 2019-2023.

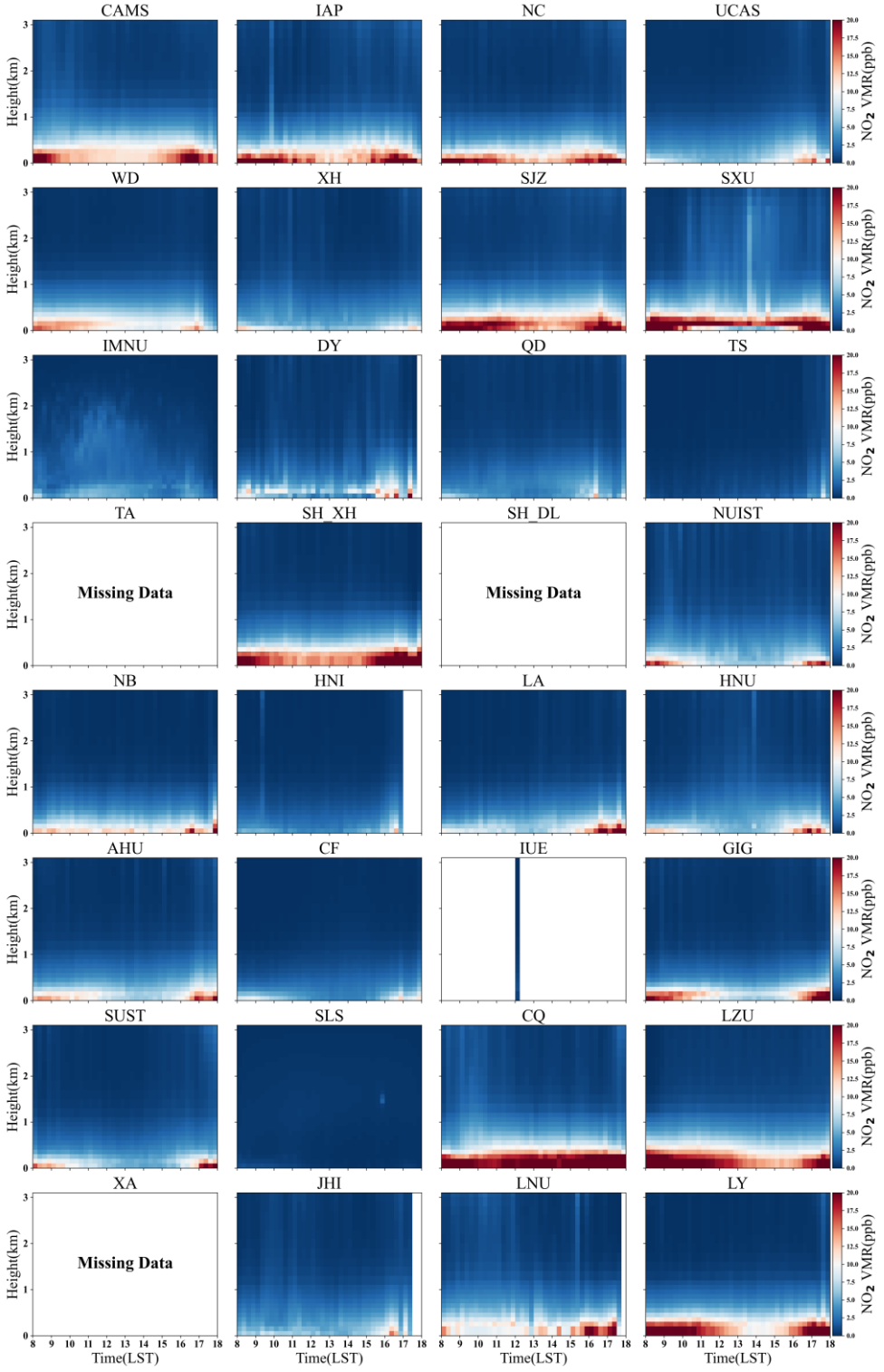


Figure S15. Diurnal variation of the autumn averaged NO2 vertical profiles during 2019-2023.

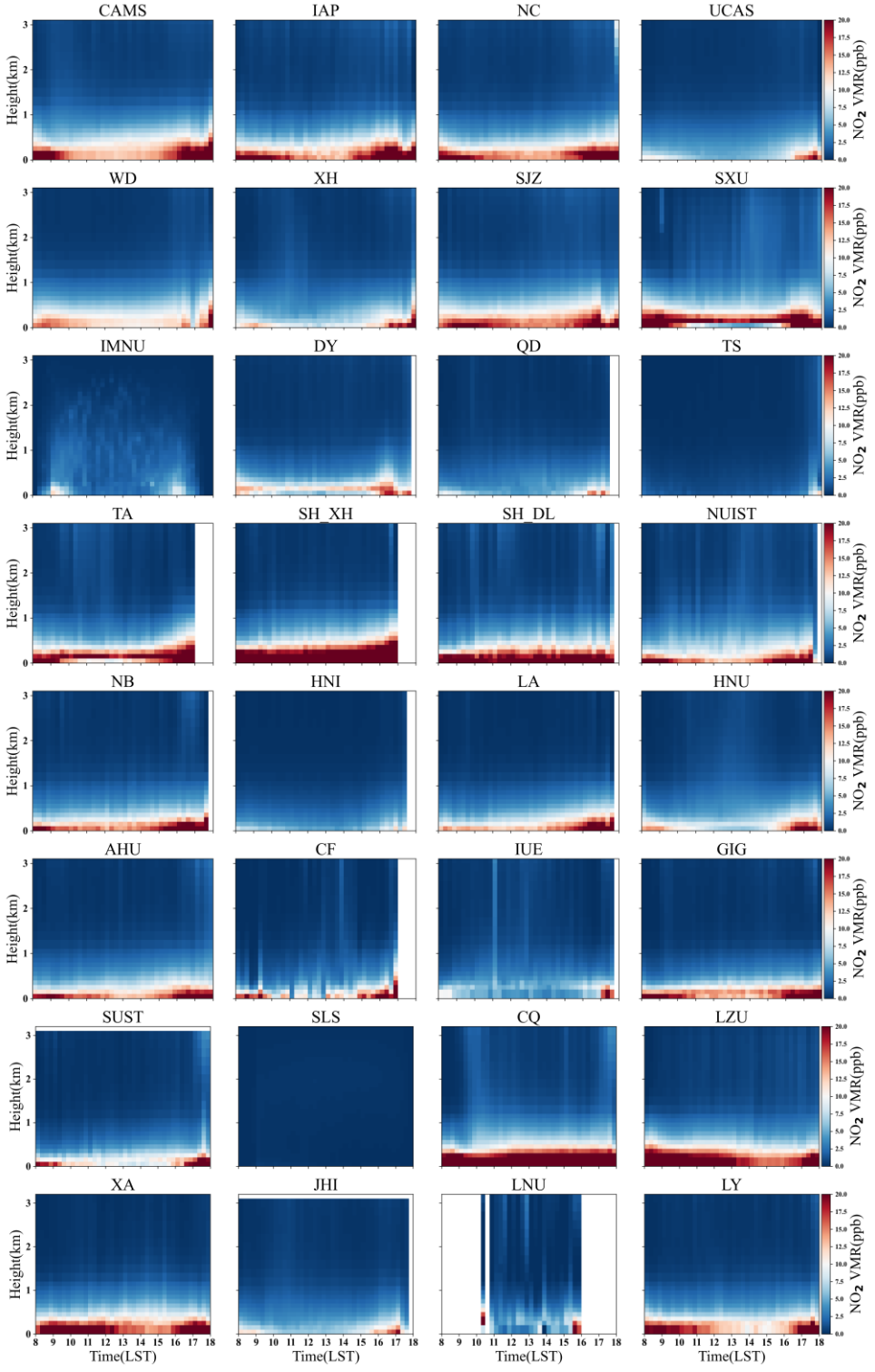


Figure S16. Diurnal variation of the winter averaged NO2 vertical profiles during 2019-2023.

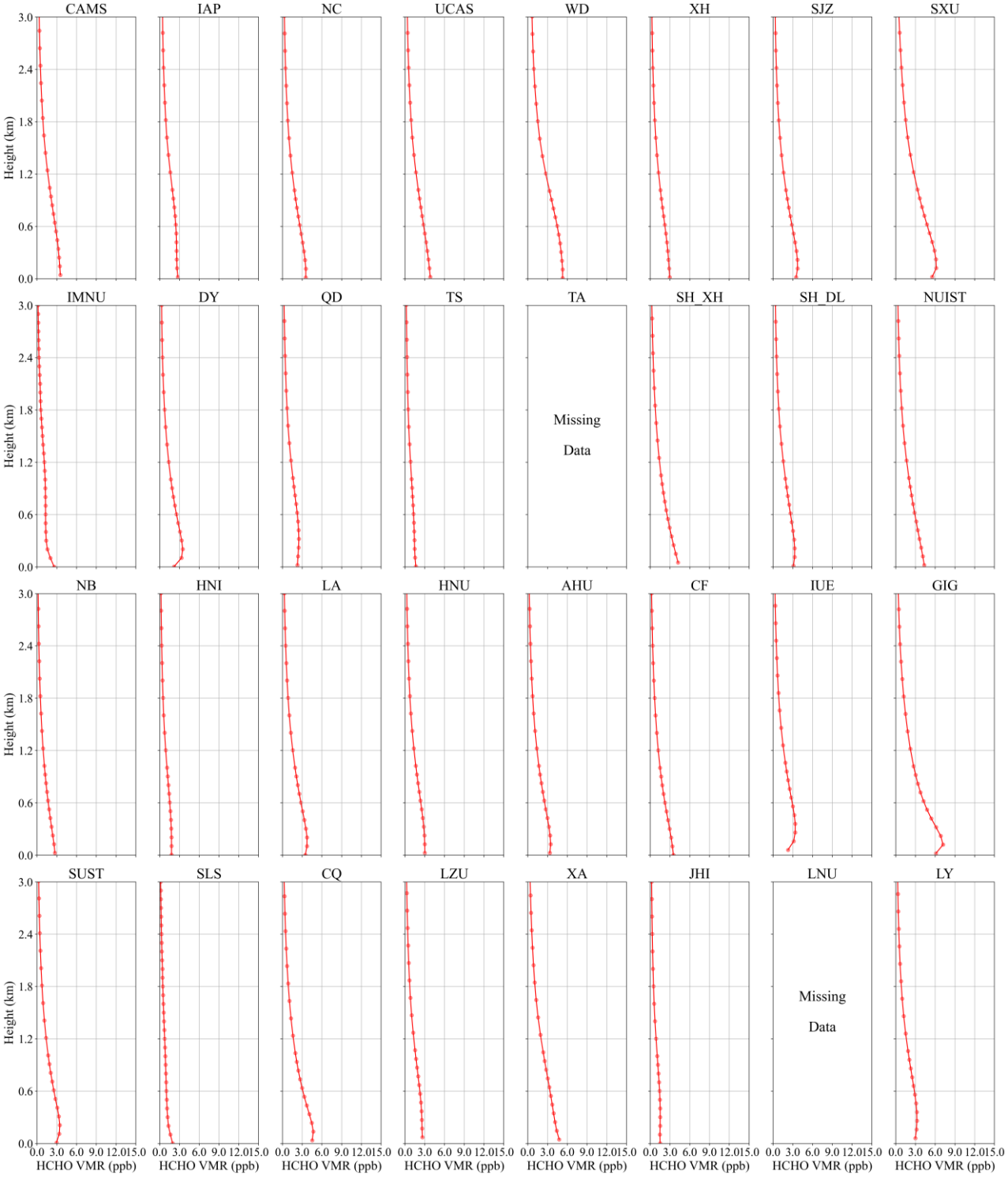


Figure S17. Spring averaged HCHO vertical profiles during 2019-2023.

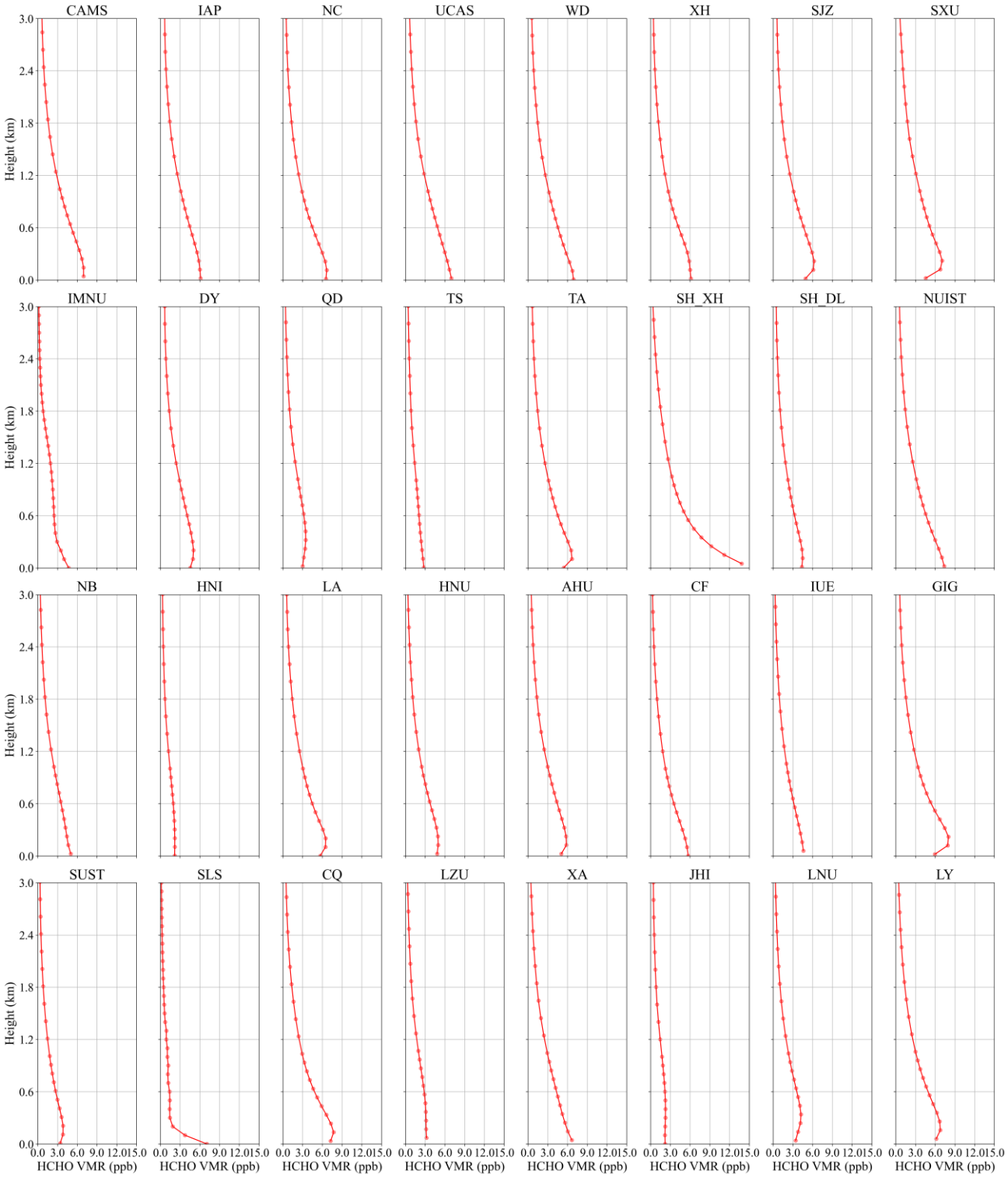


Figure S18. Summer averaged HCHO vertical profiles during 2019-2023.

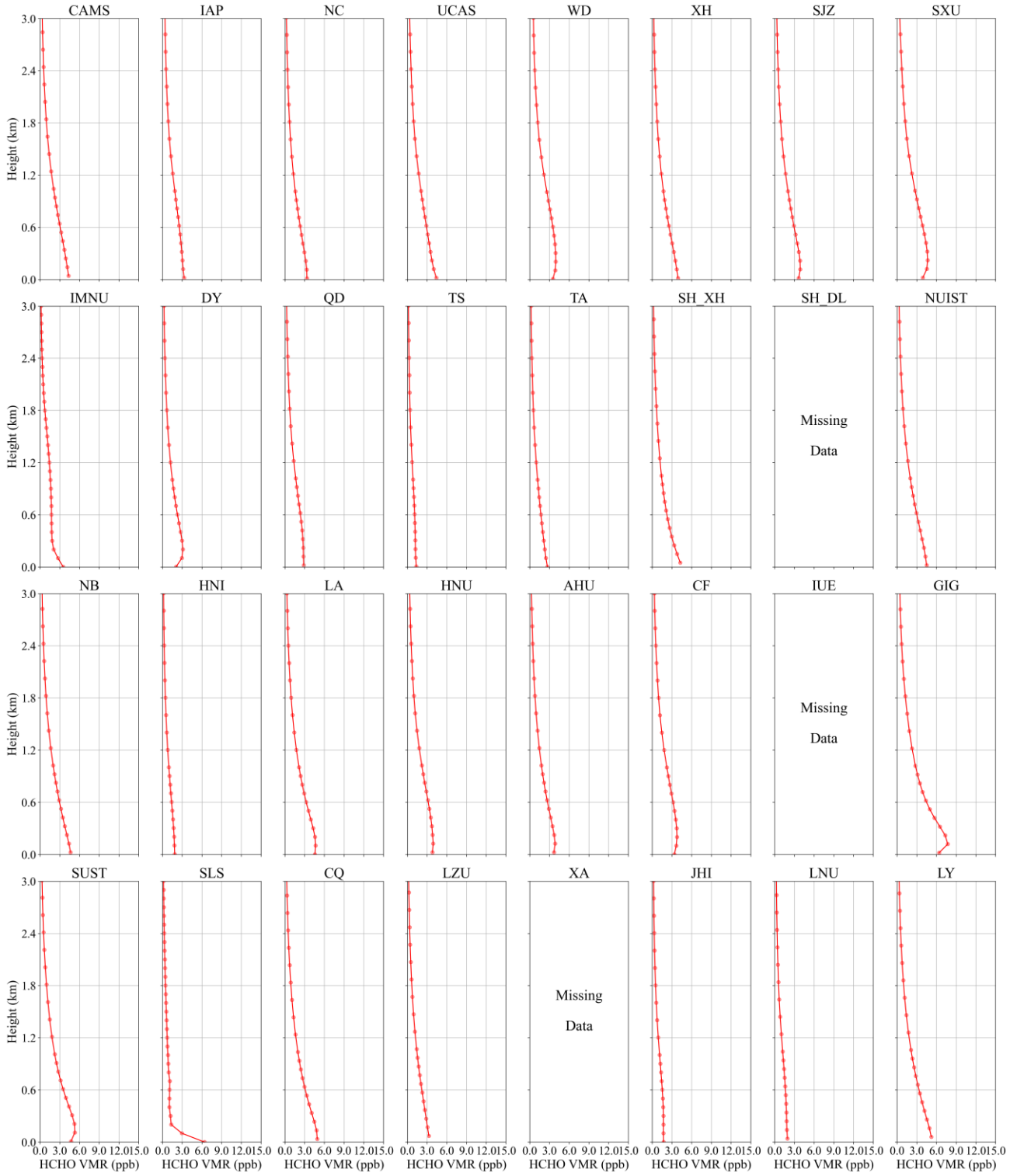


Figure S19. Autumn averaged HCHO vertical profiles during 2019-2023.

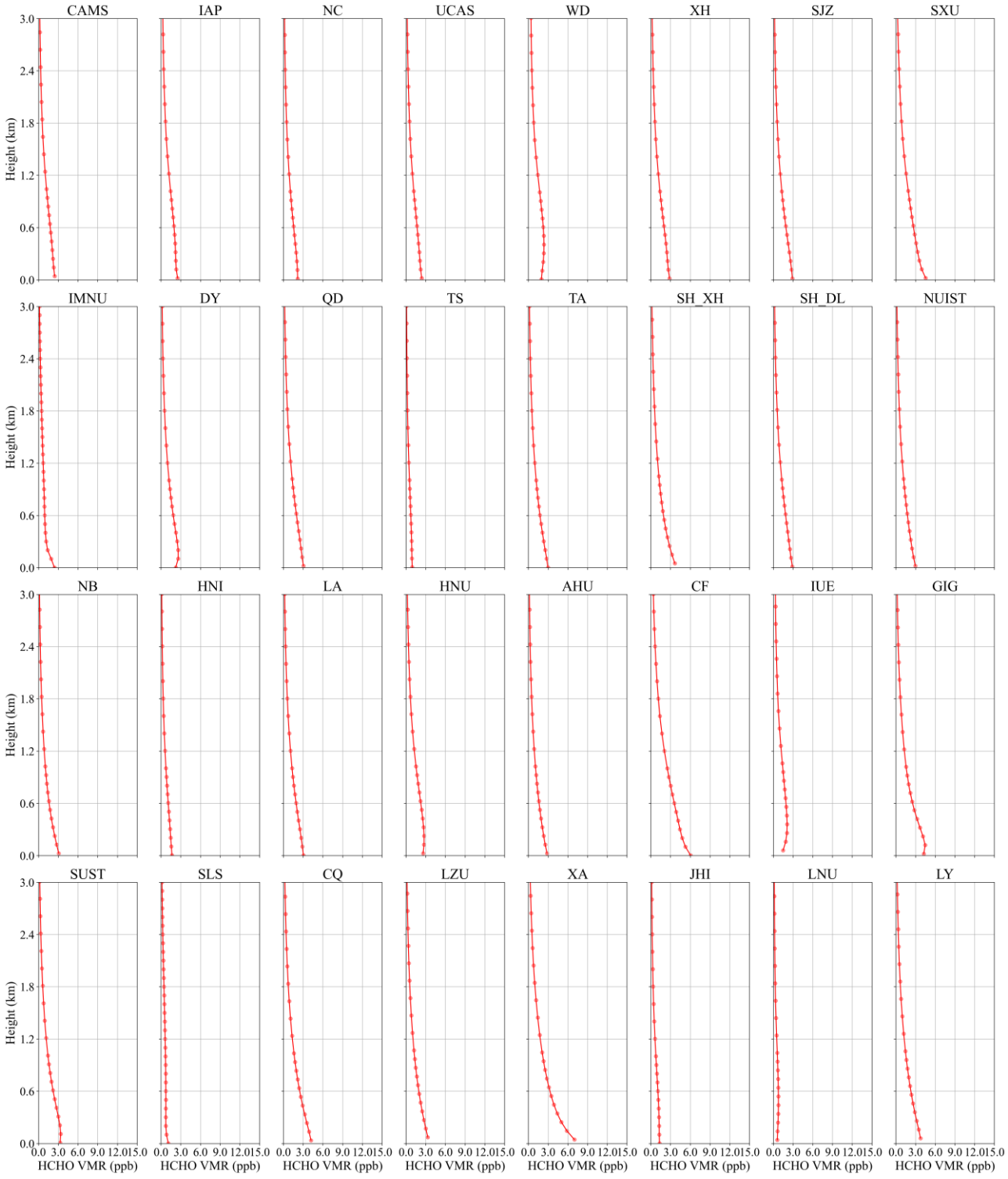


Figure S20. Winter averaged HCHO vertical profiles during 2019-2023.

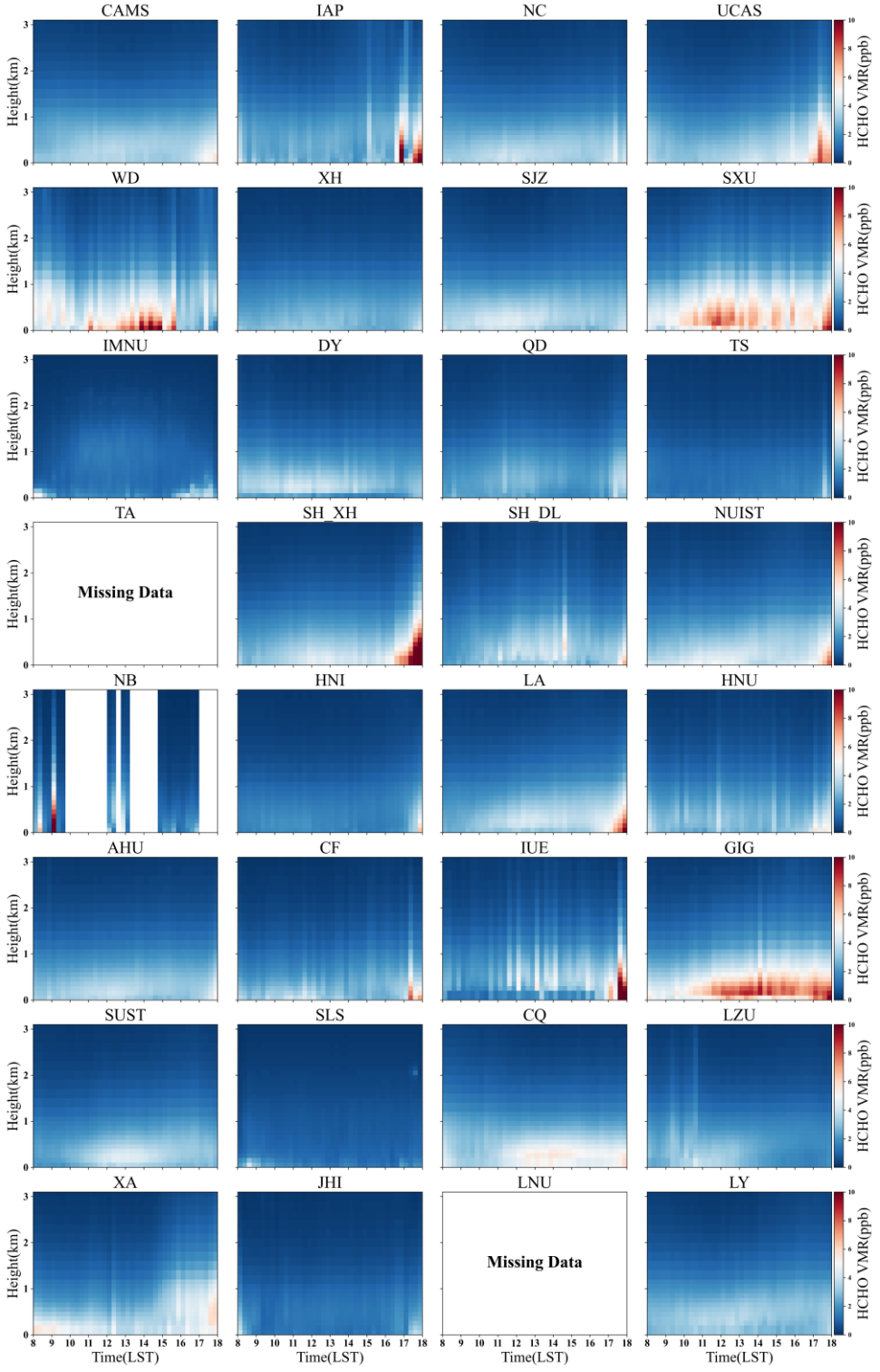


Figure S21. Diurnal variation of the spring averaged HCHO vertical profiles during 2019-2023.

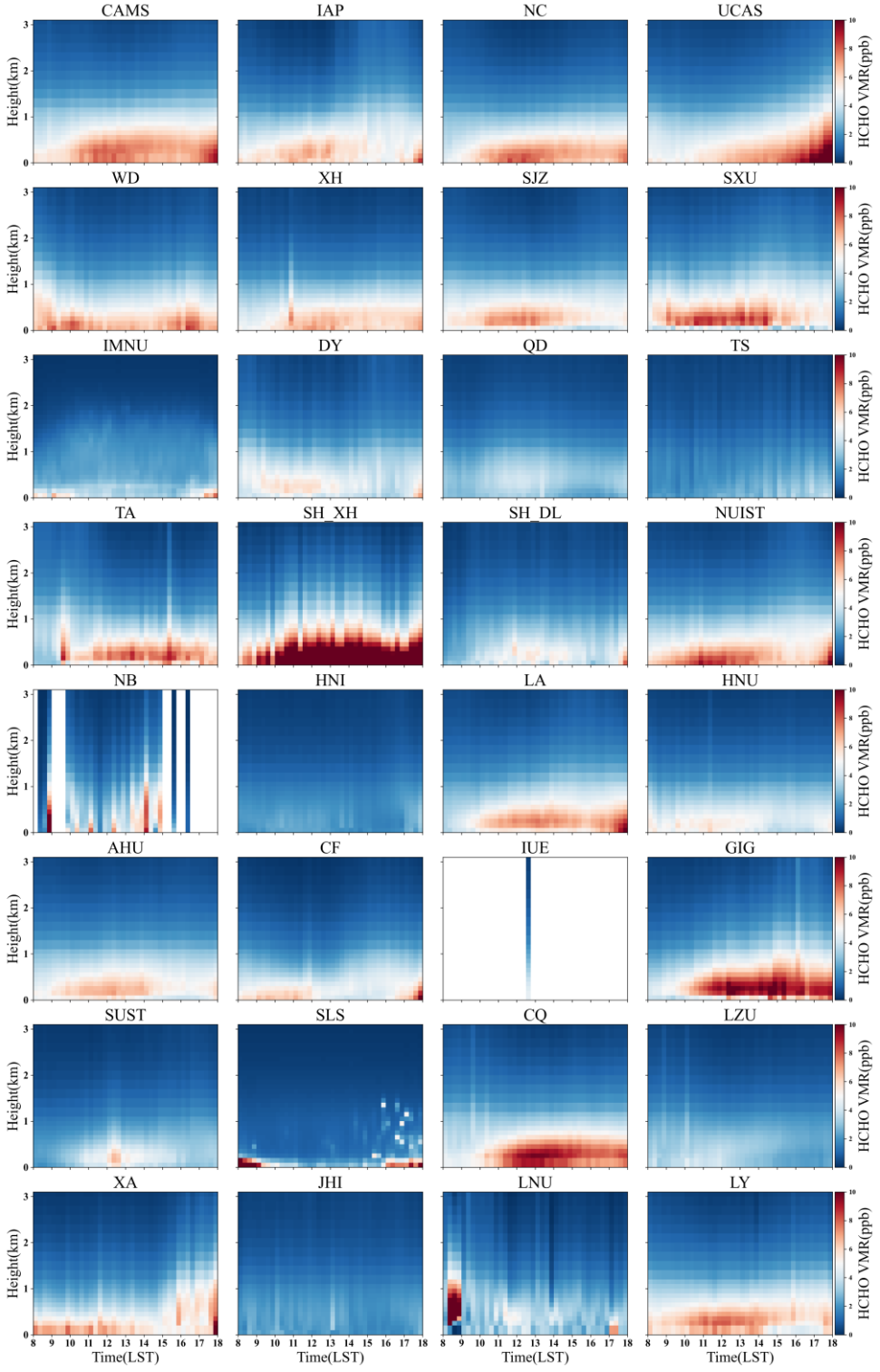


Figure S22. Diurnal variation of the summer averaged HCHO vertical profiles during 2019-2023.

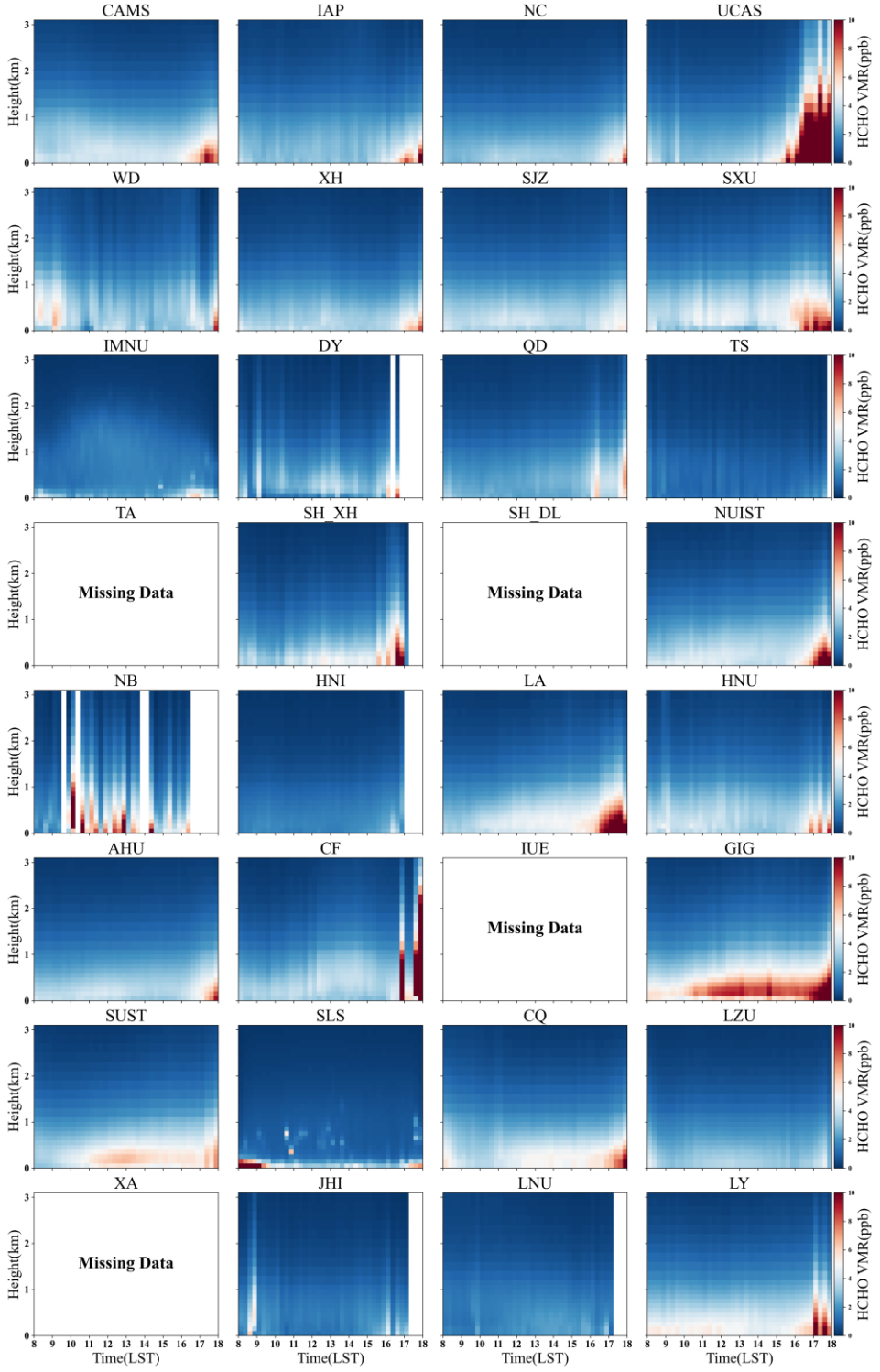


Figure S23. Diurnal variation of the autumn averaged HCHO vertical profiles during 2019-2023.

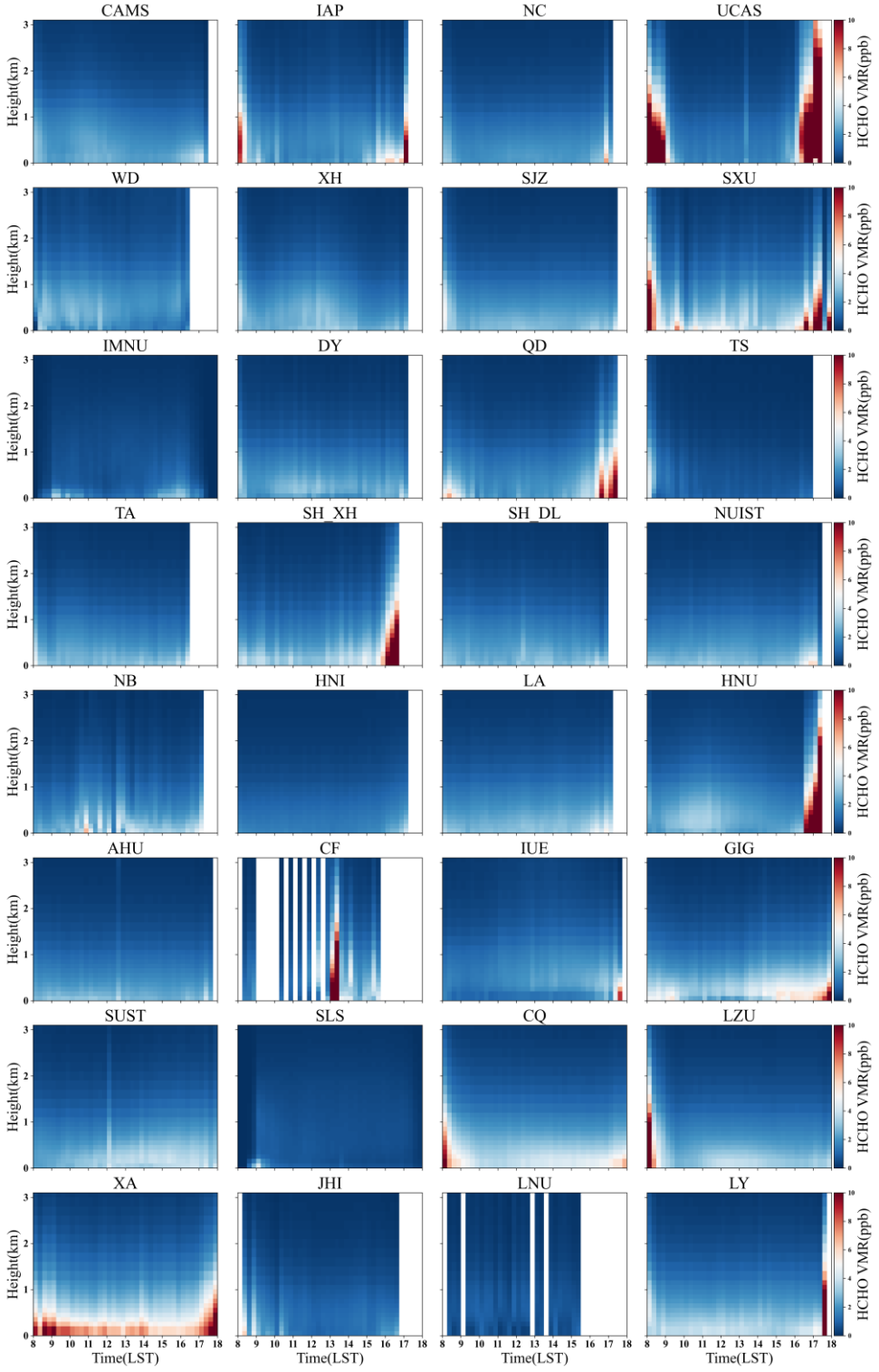


Figure S24. Diurnal variation of the winter averaged HCHO vertical profiles during 2019-2023.

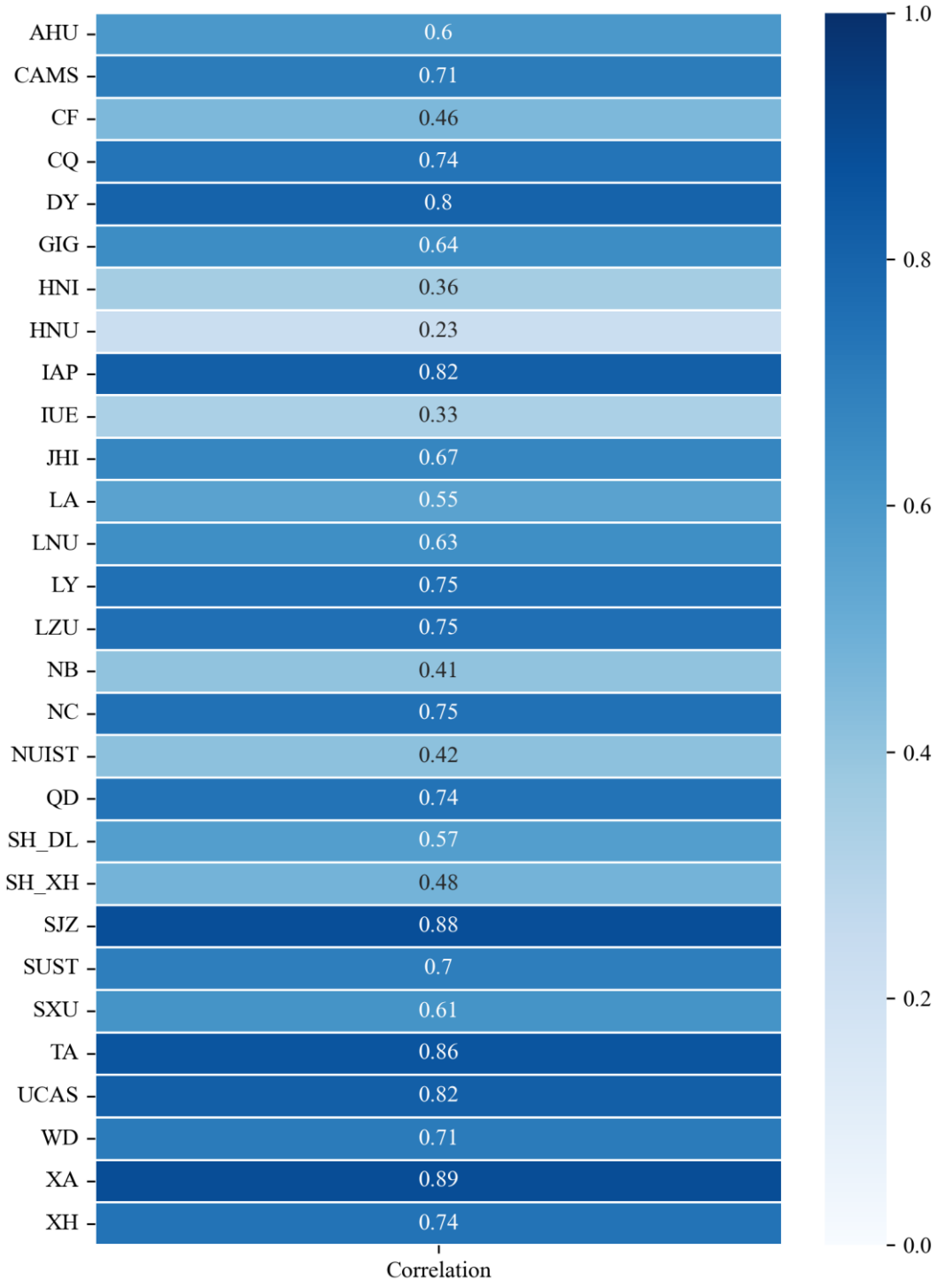


Figure S25. Correlation of surface AEC measured at each site and PM2.5 measured by CNEMC.

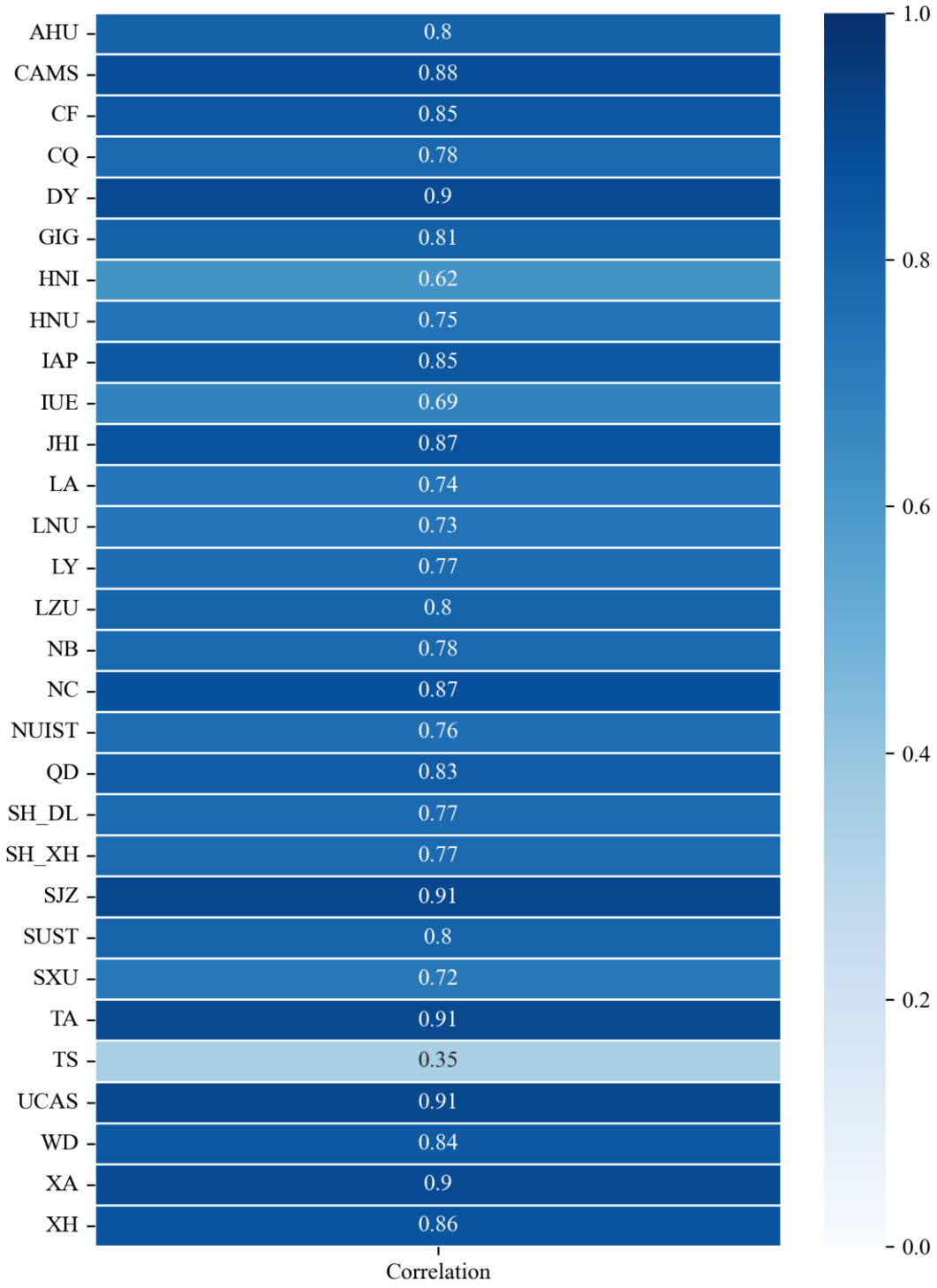


Figure S26. Correlation of NO2 concentration measured by each site and CNEMC.

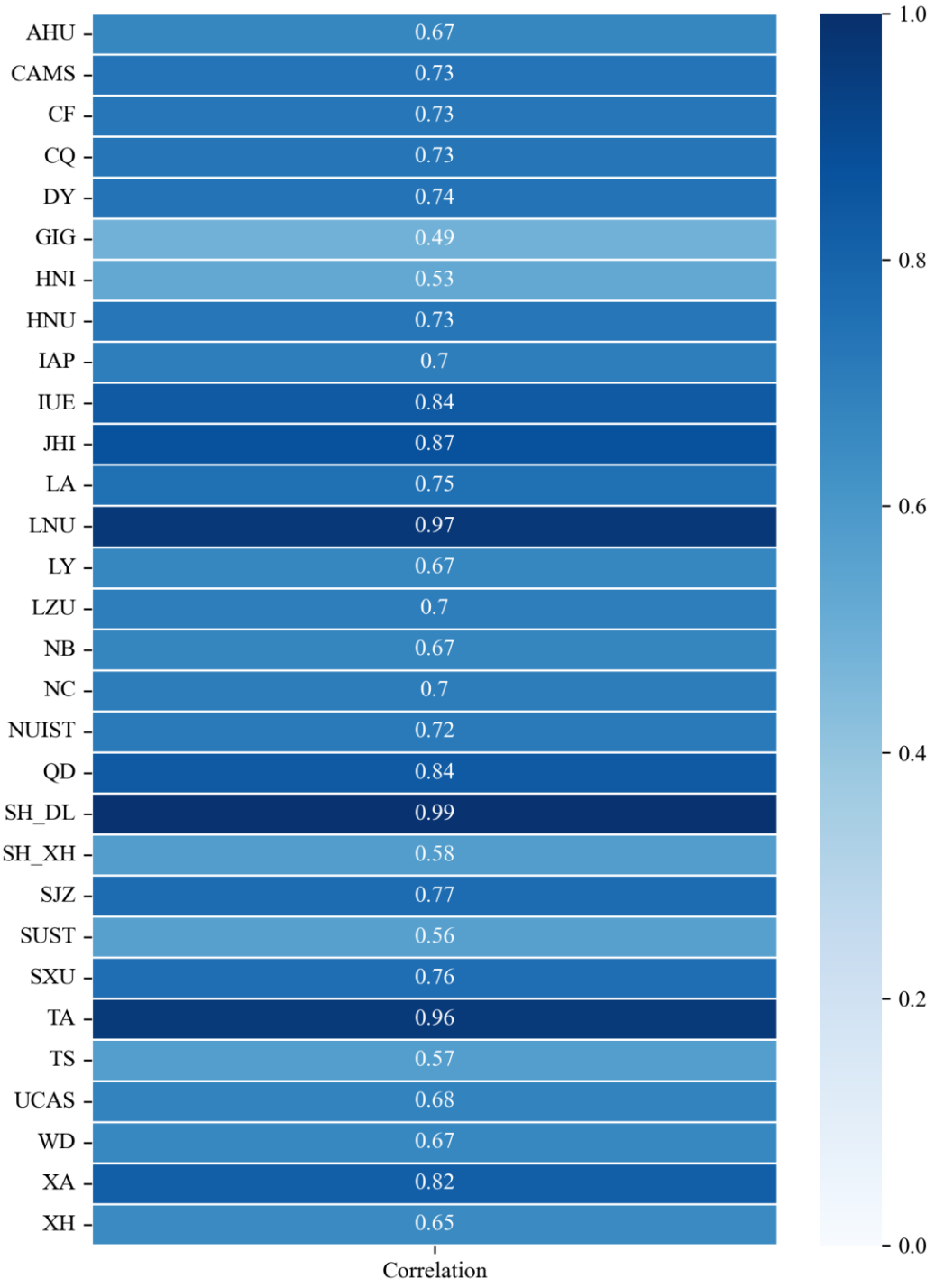


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Figure S27. Correlation of tropospheric NO2 VCD measured by each site and TROPOMI.

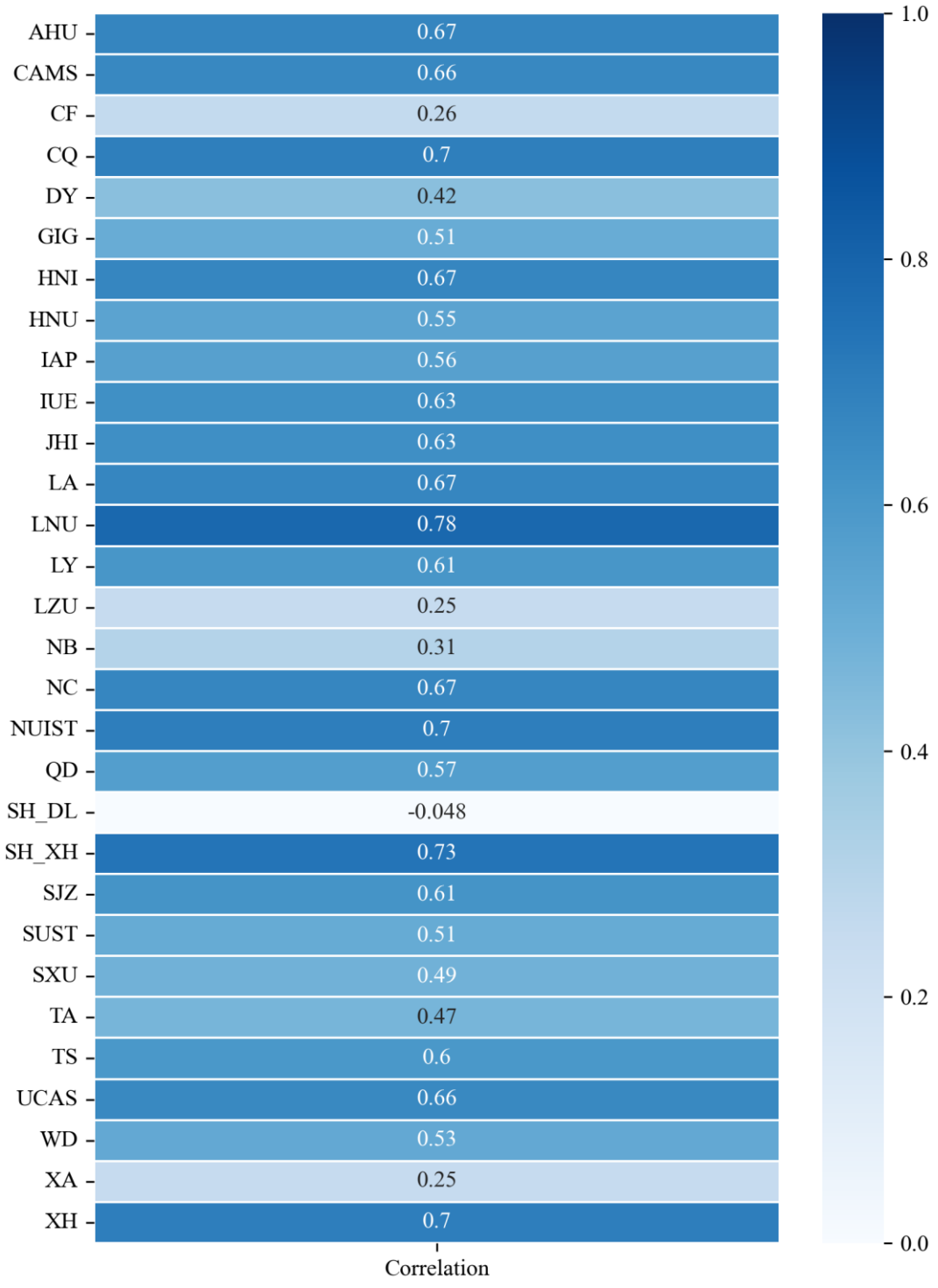

Figure S28. Correlation of tropospheric HCHO VCD measured by each site and TROPOMI