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Measurement report: Analysis of aerosol optical depth variation at Zhongshan Station in Antarctica

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Supplementary Information

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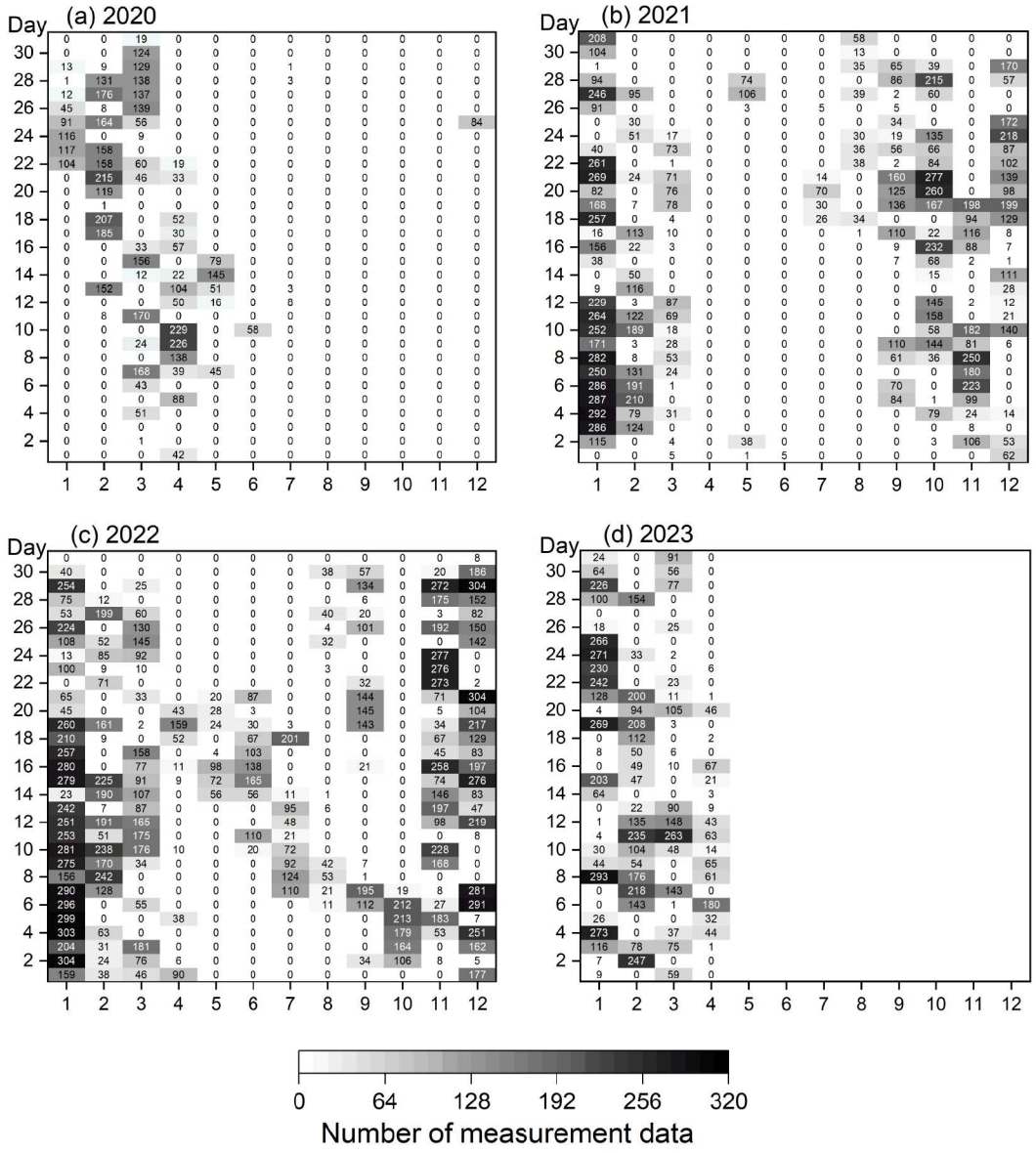

Figure S1. Number of observation data obtained from CE318-T at Zhongshan Station in (a) 2020, (b) 2021, (c) 2022, and (d) 2023, respectively.

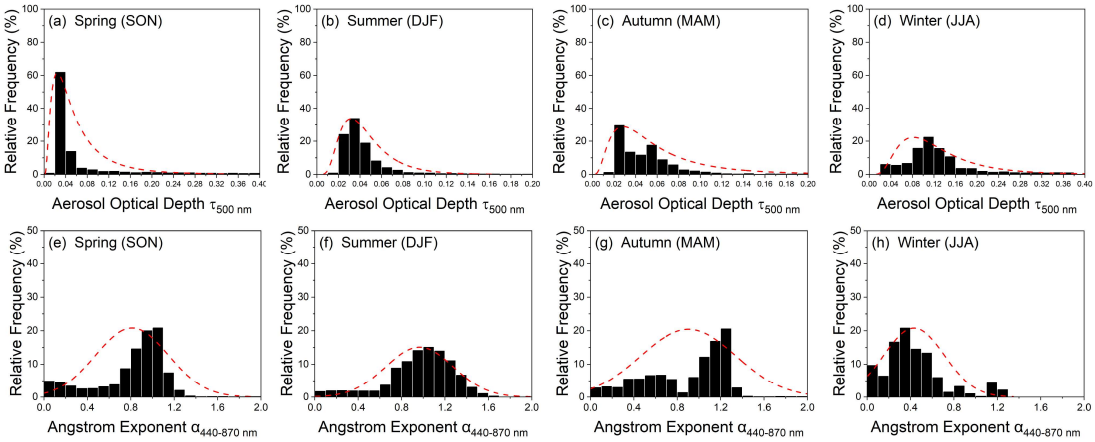

Figure S2. (a)-(h) the frequency histograms of aerosol optical depth at 500 nm ($AOD_{500\ nm}$) and

Angstrom exponent at 440-870 nm ($AE_{440\text{-}870\ nm}$) in spring, summer, autumn, and winter, respectively. The red dashed lines represent the lognormal fit curves in (a)-(d), and the normal fit curves in (e)-(h), respectively.

Figure S3. Time series of diurnal variations of $AOD_{500\ nm}$ and $AE_{440\text{-}870\ nm}$ on (a) high AOD days, and (b) low AOD days, respectively. The solid blue lines represent $AOD_{500\ nm}$ and the solid red lines represent $AE_{440\text{-}870\ nm}$.

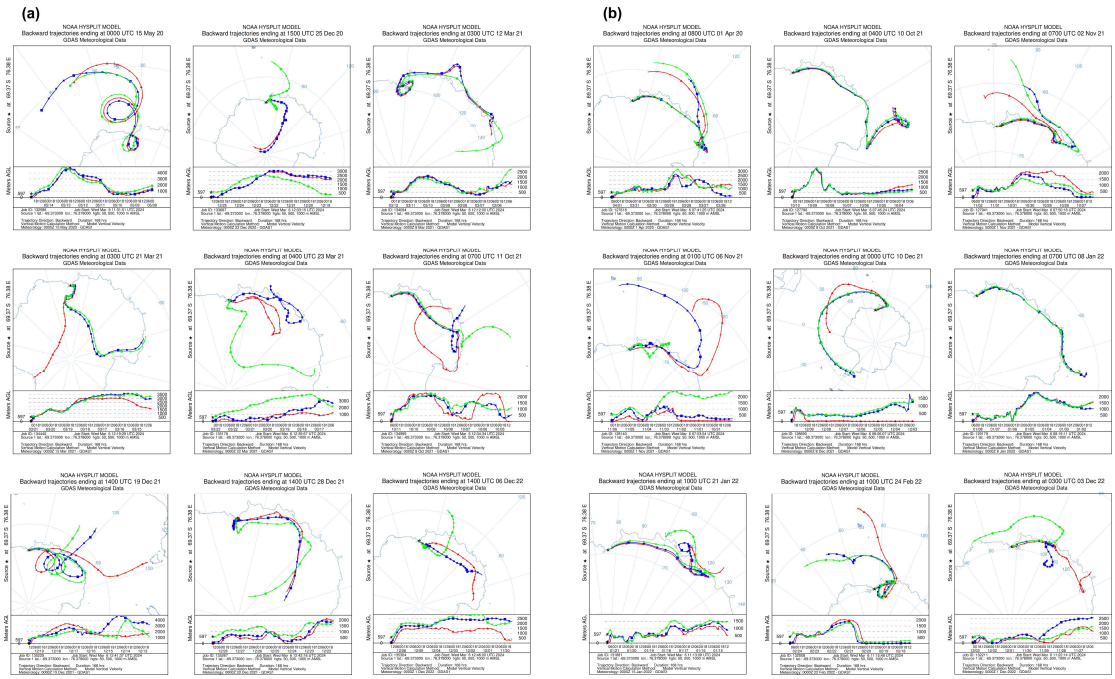

Figure S4. HYSPLIT backward trajectory of (a) low AOD days and (b) high AOD days.

Table S1. Dates are classified as low AOD days and high AOD days, respectively. Note: The fifth percentile value of the AOD daily mean is 0.02446, and days with an AOD daily mean below this value are classified as low AOD days; The 95th percentile value of the AOD daily mean is 0.14739, and days with an AOD daily mean above this value are classified as high AOD days.

Low AOD Date	$AOD_{500\ nm}$ mean	High AOD Date	$AOD_{500\ nm}$ mean
2020-05-15	0.02435	2020-04-01	0.76389
2020-12-25	0.02005	2021-10-10	0.32171
2021-03-12	0.02193	2021-11-02	0.20771
2021-03-21	0.0222	2021-11-06	0.16909
2021-03-23	0.02247	2021-12-10	0.14739
2021-10-11	0.02431	2022-01-08	0.17626
2021-12-19	0.02329	2022-01-21	0.80477
2021-12-28	0.02155	2022-02-24	0.34481
2022-12-6	0.02446	2022-12-3	0.18311
***The P5 of total $AOD_{500\ nm}$ mean: 0.02446**		***The P95 of total $AOD_{500\ nm}$ mean: 0.14739**	