

Online Supplemental Material

Dust particles in the free troposphere over a Chinese desert region as revealed from balloon-borne measurements under calm weather conditions

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Supplementary Figures S1–S4 and Tables S1–S2

china_topography

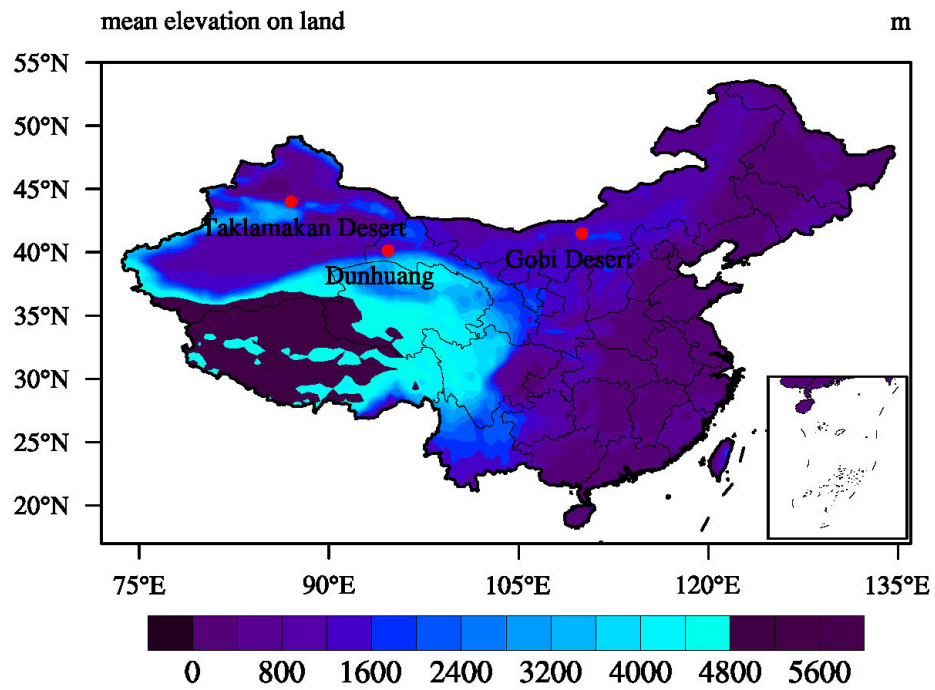


Figure S1. Observational site at Dunhuang, near the western edge of the Taklamakan Desert, China.

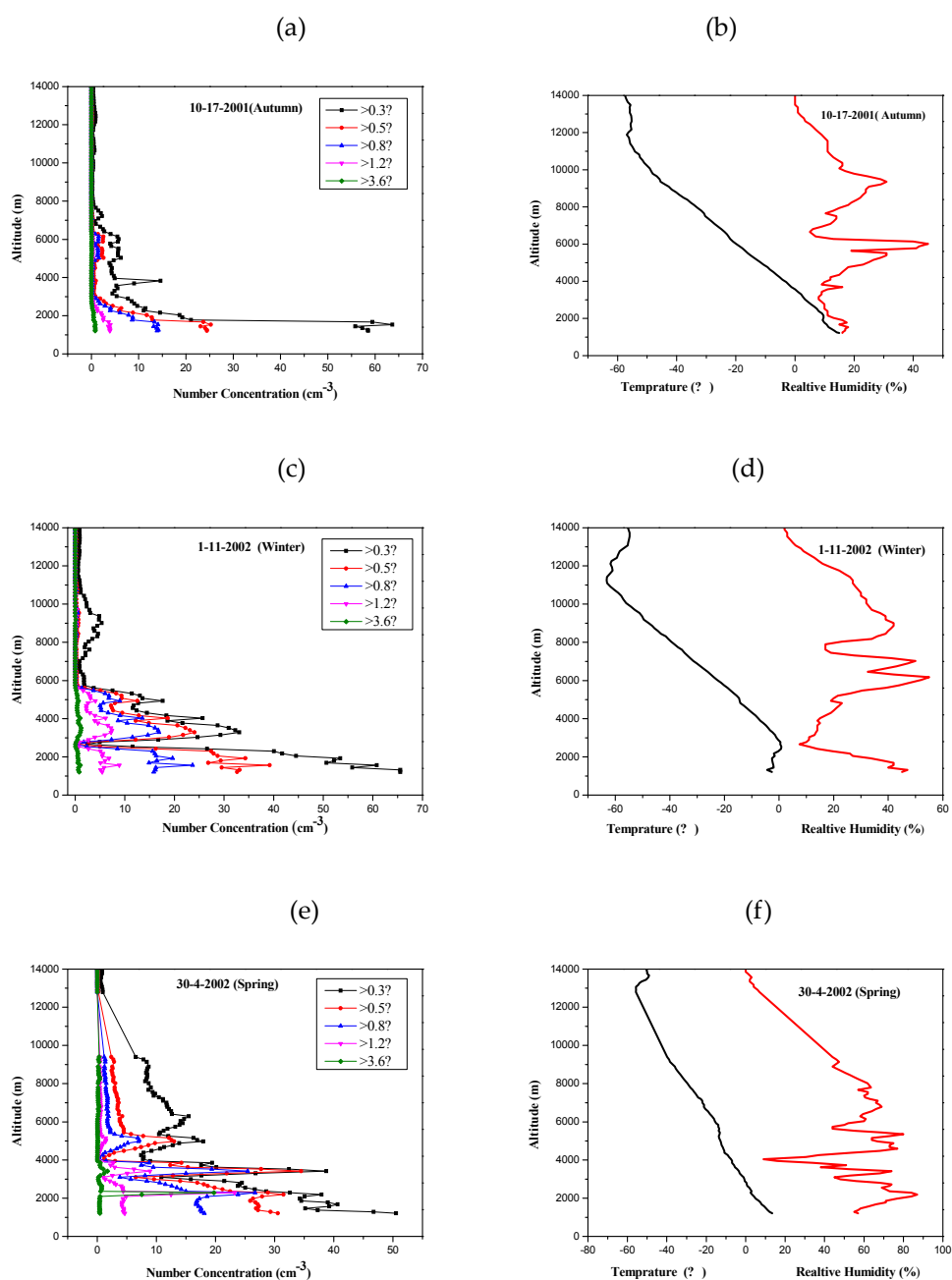


Figure S2. The (a, c, e) aerosol number concentrations (0.3 μ m, 0.5 μ m, 0.8 μ m, 1.2 μ m, 3.6 μ m) and (b, d, f) atmospheric temperature (black line) and relative humidity (red line) in the troposphere observed on (a, b) 17 October 2011, (c, d) 11 January 2002, and (e, f) 30 April 2002 at Dunhuang, China.

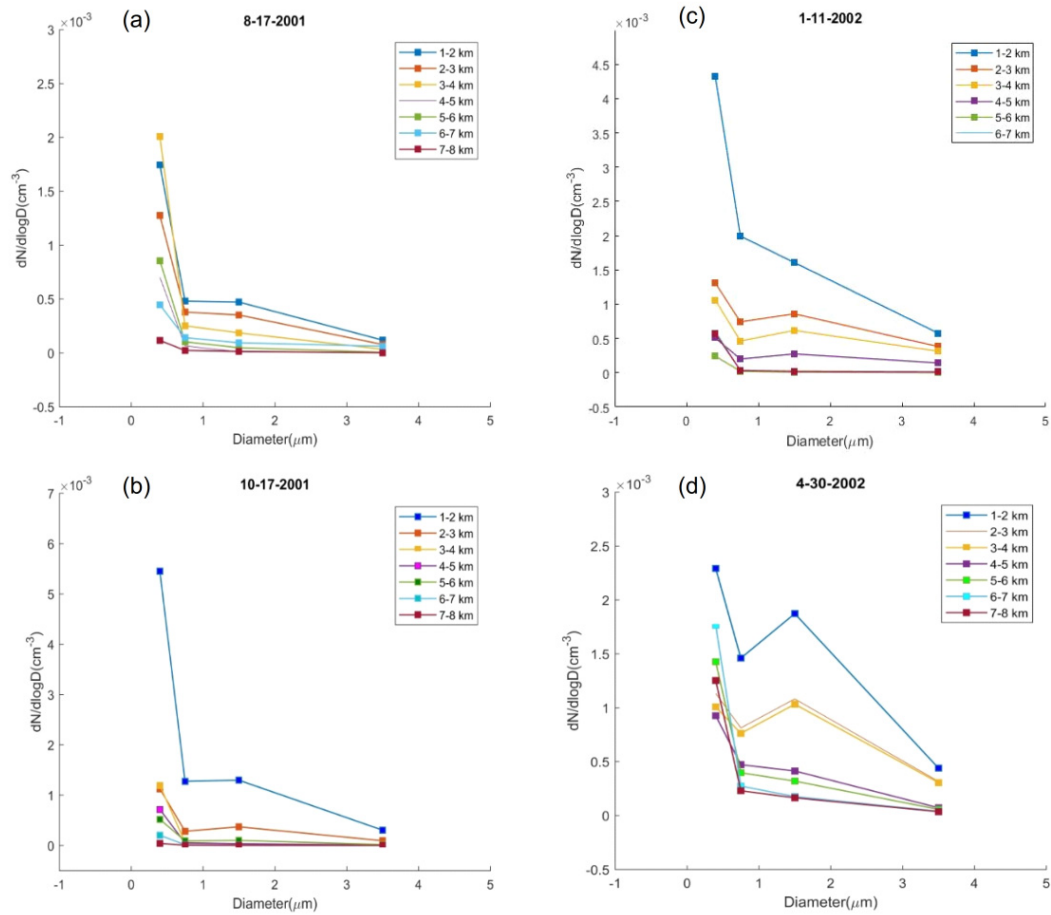


Figure S3. Size distribution patterns of dust particles measured in the free troposphere on (a) 17 August 2001, (b) 17 October 2001, (c) 11 January 2002, and (d) 30 April 2002 at Dunhuang, China.

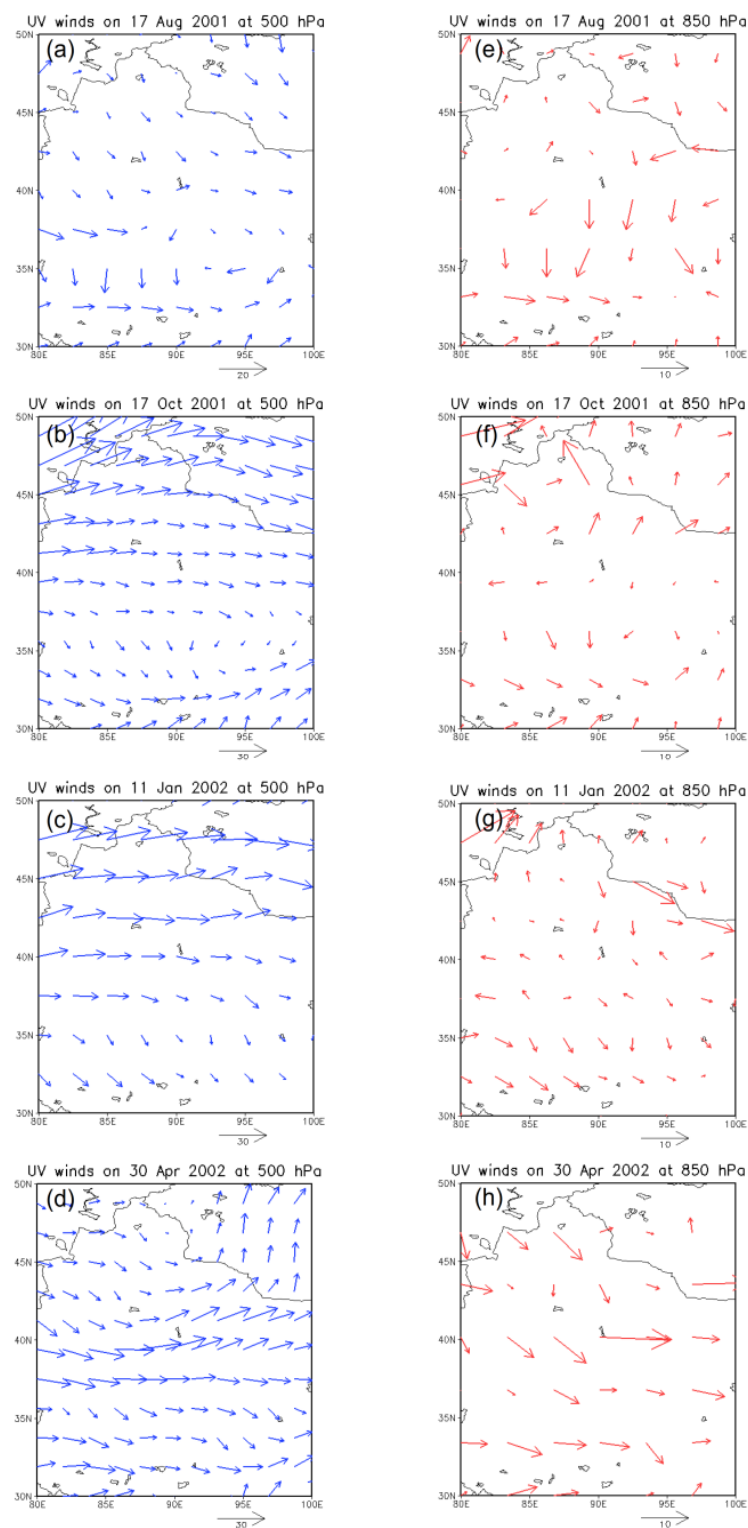


Figure S4. Patterns of air masses at 500 hPa and 850 hPa on (a) 17 August 2001, (b) 17 October 2001, (c) 11 January 2002, and (d) 30 April 2002 over Dunhuang and the Taklamakan Desert region, China.

Table S1. Balloon-borne OPC specification.

Balloon-borne OPC parameters	Specifications
Volume	30 × 35 × 35 cm
Weight	5.5 kg (including battery)
Operation time	6 h
Detection	Forward scattering light detection
Detector of scattering light	13°–44° from the laser beam axis
Light source	Photodiode
Sampling time interval	Laser diode; wavelength = 810
Frequency of radio wave for data	nm
transmittance	20 seconds per measurement
	400 MHz (Vaisala radiosonde)

Table S2. Balloon launch times (local time), dates, and weather conditions of the observational period.

Date	Balloon launching time	Weather conditions
17 August 2001	1315	Fine but very thin clouds, northeast wind near surface and below 3 km, wind speed at 1.5 km of 14 m s^{-1}
17 October 2001	1130	Weak wind, clear, no cloud, low temperature, calm weather conditions, and strong northwest wind above 1 km
11 January 2002	1200	No cloud, no wind, visibility of 15 km, weather conditions calm, thick inversion layer from surface to 2.5 km, southwest wind
30 April 2002	1200	Just after drizzle, visibility of 30 km, fully cloudy, westward surface wind, southeast wind above 5 km, thin inversion layer form surface to 400 m