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Dynamic and thermal analysis of dust storm processes based on vertical observation data

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Supplementary Table S1. Single event-level dust-storm windows and complete original station records

For non-hourly station records, the reference time was rounded to the analysis hour; therefore, it may differ slightly from the exact onset time listed in Supplementary Table S1.

Event	Reference station	Selected event-level dust-storm window (UTC)	Complete original station record(s) (BJT)	Basis for time selection
Dust1	TZ	2024-03-31 12:00 to 2024-04-01 09:00	TZ 80 m deposition: 2024-03-31 20:00 to 2024-04-01 17:00, dust storm. XT 100 m deposition: 2024-03-31 20:40 to 2024-04-01 14:00, rain plus dust storm.	A single event-level window was selected from the earlier dust-storm record.
Excluded event	XT	2024-04-05 01:00 to 2024-04-05 06:00	XT 100 m deposition: 2024-04-05 09:00 to 14:00, dust storm.	This single-station dust-storm event was excluded from the paired-event analysis because the corresponding TZ sample was unavailable.
Dust2	XT	2024-04-12 04:00 to 2024-04-12 11:30	XT 100 m deposition: 2024-04-12 12:00 to 19:30, dust storm; 2024-04-13 17:30 to 19:30, blowing dust. TZ 100 m deposition: 2024-04-14 12:00 to 23:00, dust storm; 2024-04-15 07:00 to 20:00, floating dust.	The earlier dust-storm interval with a complete original start and end time was selected.
Dust3	XT	2024-04-17 11:00 to 2024-04-18 12:00	TZ 80 m deposition: 2024-04-18 18:00 to 2024-04-20 06:00, dust storm plus blowing dust. XT 100 m deposition: 2024-04-17 19:00 to 2024-04-18 20:00, dust storm; 2024-04-19, thunderstorm and light rain at 03:00.	The XT dust-storm interval started earlier and was therefore used as the single event-level window.
Dust4	TZ	2024-04-26 20:50 to 2024-04-27 13:30	TZ 80 m deposition: 2024-04-27 04:50 to 21:30, dust storm; 2024-04-28, blowing dust all day; 2024-05-09 19:30 to 20:30, blowing dust. XT 100 m deposition: 2024-04-26 10:00 to 2024-04-27 06:00, blowing dust; 2024-04-27 06:00 to 17:00, dust storm; 2024-04-28 14:00 to 19:30, dust storm; 2024-05-09 16:30 to 22:30, blowing dust.	The TZ dust-storm interval was selected; the manuscript event time can be rounded from 20:50 to 21:00 UTC where hour-level timing is required.
Dust5	XT	2024-05-12 07:30 to 2024-05-12 14:30	TZ 80 m deposition: 2024-05-12 to 2024-05-13, dust storm. XT 100 m deposition: 2024-05-12 15:30 to 22:30, dust storm; 2024-05-13 to 2024-05-15, blowing dust and afternoon light rain.	The XT dust-storm interval was selected because it provides a complete original start and end time.
Dust6	XT	2024-05-20 11:00 to 2024-05-20 14:30	TZ 80 m deposition: 2024-05-20, blowing dust; 2024-05-22, blowing dust; 2024-05-26, blowing dust; 2024-05-27, blowing dust; 2024-05-31, blowing dust; 2024-06-01, rain. XT 100 m deposition: 2024-05-20 19:00 to 22:30, dust storm; 2024-05-21 22:00 to 23:00, blowing dust; 2024-05-29 20:00 to 22:00, blowing dust; floating dust every afternoon from 2024-05-17 to 2024-05-29; rain on 21, 22, and 27 May.	The XT dust-storm interval was selected because it is the clear dust-storm record for this event.
Dust7	TZ	2024-06-04 04:00 to 2024-06-04 16:00	TZ 80 m deposition: 2024-06-04 12:00 to 24:00, dust storm. XT 100 m deposition: 2024-06-01 16:00 to 17:00, blowing dust; 2024-06-04 12:00 to 15:00, dust storm; 2024-06-05 18:00 to 20:00, blowing dust.	Both stations recorded a dust storm from 2024-06-04 12:00 BJT; the longer TZ interval was used as the single event-level window.
Dust8	TZ	2024-06-18 07:00 to 2024-06-18 09:00	TZ 80 m deposition: 2024-06-15 17:30 to 19:40, blowing dust; 2024-06-16 15:00 to 15:40, blowing dust; 2024-06-18 15:00 to 17:00, dust storm; 2024-06-30 17:00 to 20:20, blowing dust; 2024-07-01 19:00 to 21:00, blowing dust; 2024-07-02 12:00 to 17:00, blowing dust; 2024-07-09 15:30 to 18:00, blowing dust. XT 100 m deposition: 2024-06-12 18:45 to 20:10, blowing dust; 2024-06-18 15:20 to 19:00, dust storm; 2024-06-25 21:00 to 21:40, blowing dust; 2024-06-26 10:00 to 19:00, blowing dust; 2024-07-01 10:00 to 16:00, blowing dust; 2024-07-02 20:20 to 21:10, blowing dust.	The TZ dust-storm interval on 18 June started earlier and was therefore used as the single event-level window.