

Supplement of

Atmospheric Forcing of Dust Source Activation across East Asia

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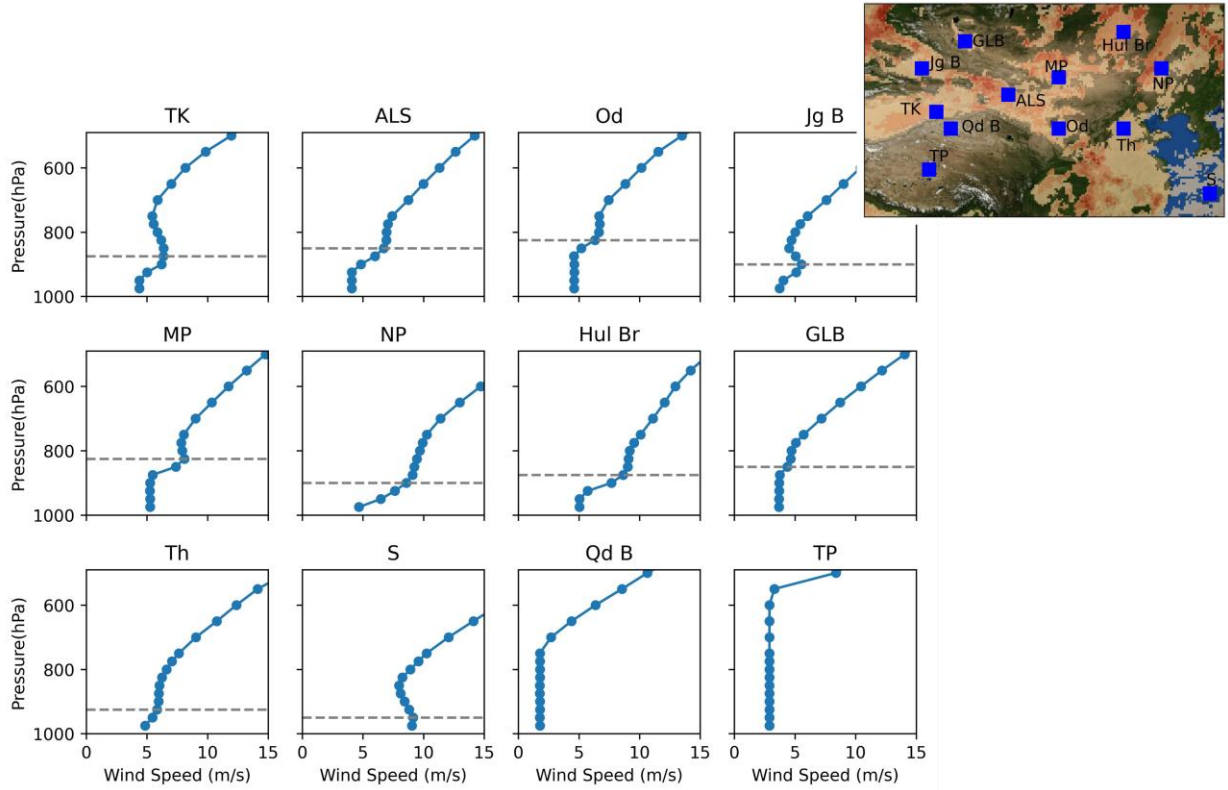


Figure S1. Wind profiles averaged over 2016–2023 for selected regions used to determine the jet-nose height. The grey dashed lines indicate the jet nose height characterized by wind speed maximum. High LLJ occurrence regions labelled in black include the Taklimakan Desert (TK), the Alashan Plateau (ALS), the Ordos Plateau (Od), the Jugger Basin (Jg B), the Mongolian Plateau (MP), the Northeast Plain (NP), the Huluin Buir Desert (HL), the Great Lake Basin (GLB), the east side of Taihang Mountain (Th), the China East Sea (S), the Qaidam Basin (Qd B) and the Tibetan Plateau (TP). Inset basemap from NASA’s Blue Marble: Shaded Relief imagery © NASA.

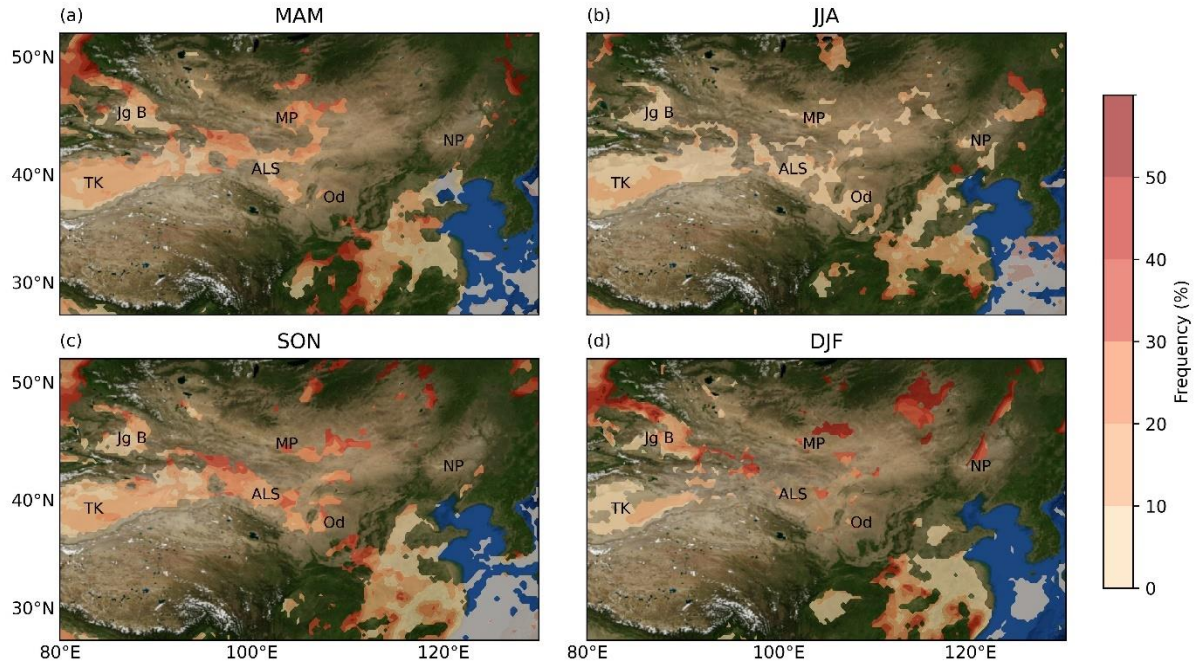


Figure S2. Seasonal frequency (%) of Low-Level Jet (LLJ) occurrence, characterized by $\Delta v \geq 5$ m/s between the 975 hPa level and the jet-nose pressure, averaged at 09:00 local solar time (LST) from 2016 to 2023. The seasons are represented as: (a) Spring (March, April, and May, MAM), (b) Summer (June, July, and August, JJA), (c) Autumn (September, October, and November, SON), and (d) Winter (December, January, and February, DJF). High LLJ occurrence regions labelled in black include Jugger Basin (Jg B), the Mongolian Plateau (MP), the Alashan Plateau (ALS), the Northeast Plain (NP), the Taklimakan Desert (TK), and the Ordos Plateau (Od). Values < 0.1 % are masked and not shown. Basemap from NASA's Blue Marble: Shaded Relief imagery © NASA.

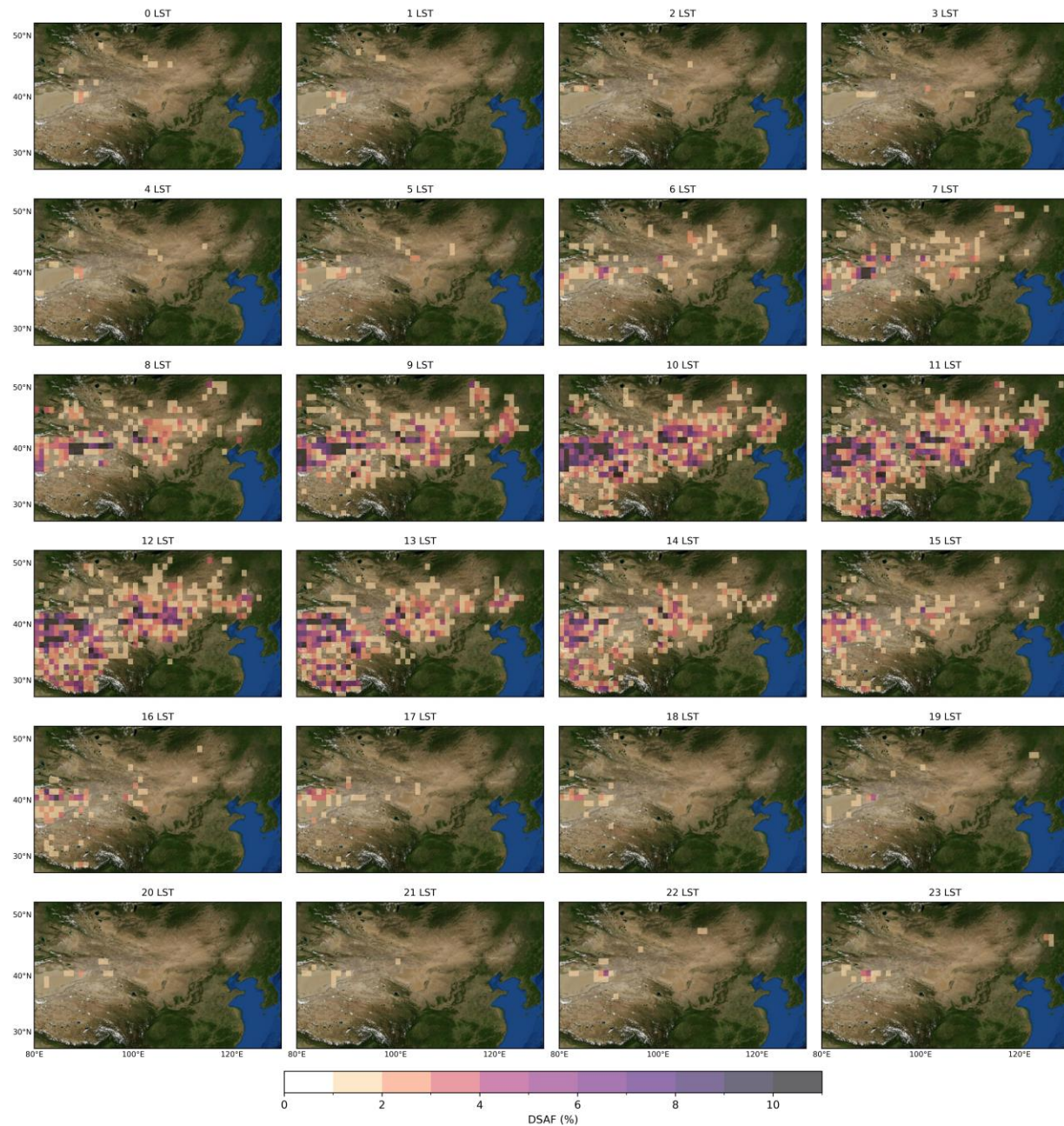


Figure S3. Average annual Dust Source Activation (DSA) Frequency map in East Asia from 2016 to 2023 under clear-sky condition for all hours between 00:00 and 23:00 local solar time (LST). Basemap from NASA's Blue Marble: Shaded Relief imagery © NASA.