



Supplement of

Expanding the simulation of East Asian super dust storms: physical transport mechanisms impacting the western Pacific

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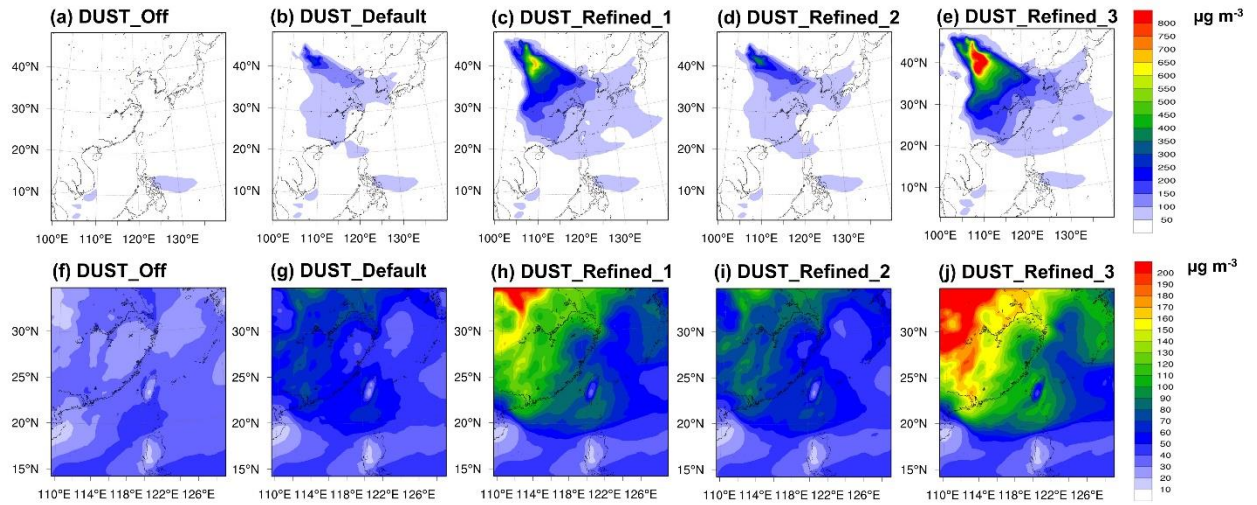


Figure S1: Daily average modeled PM₁₀ concentrations over East Asia under the following simulation scenarios: (a, f) Dust_Off, (b, g) Dust_Default_1, (c, h) Dust_Refined_1, (d, i) Dust_Refined_2 and (e, j) Dust_Refined_3.

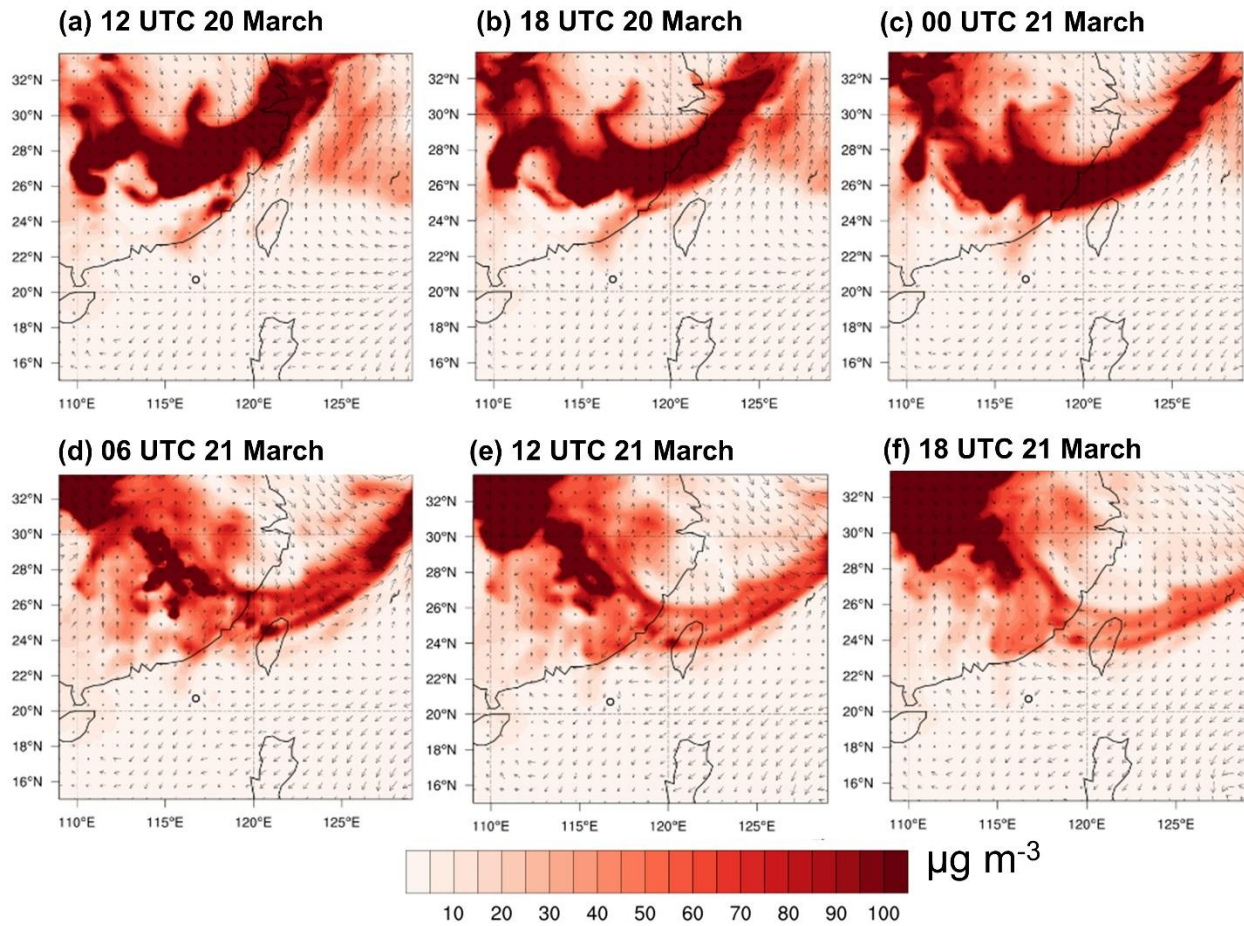


Figure S2: MERRA2 surface dust mass concentrations during (a) 12 UTC 20 March, (b) 18 UTC 20 March, (c) 00 UTC 21 March, (d) 06 UTC 21 March, (e) 12 UTC 21 March and (f) 18 UTC 21 March.

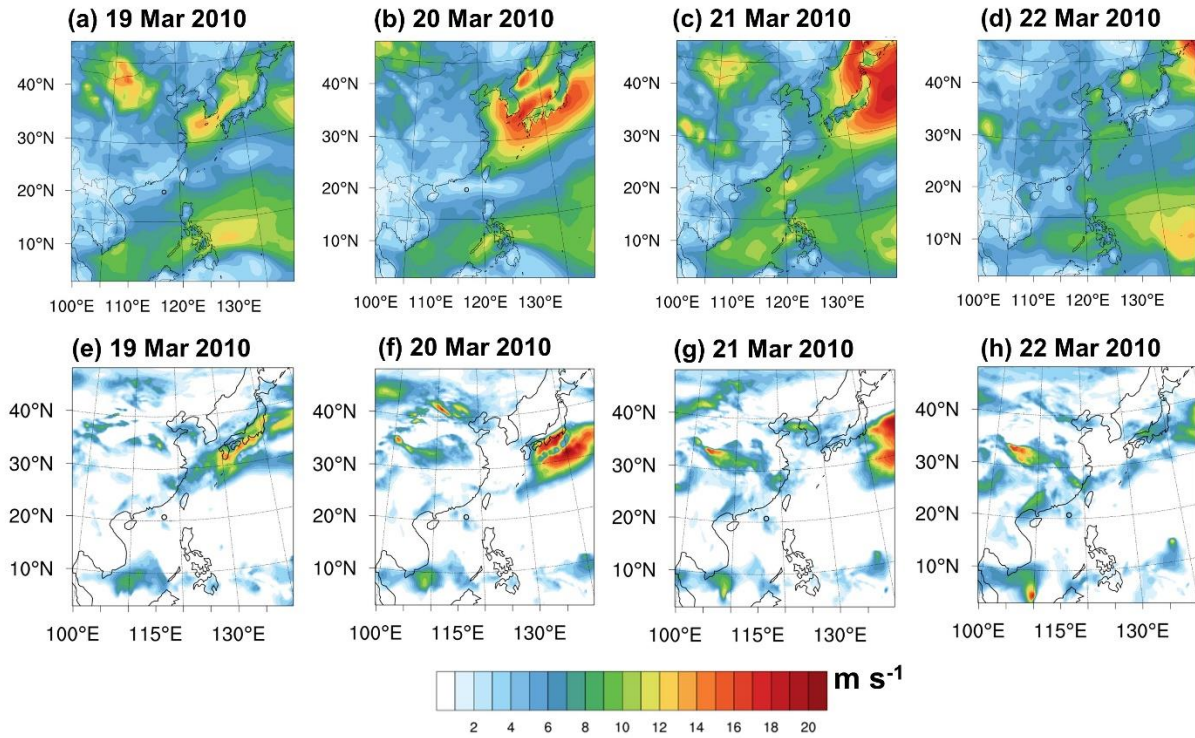


Figure S3: Simulated wind speed (upper panel) and MERRA-2 reanalysis wind speed (lower panel) during (a, e) 19 March, (b, f) 20 March, (c, g) 21 March and (d, h) 22 March 2010.

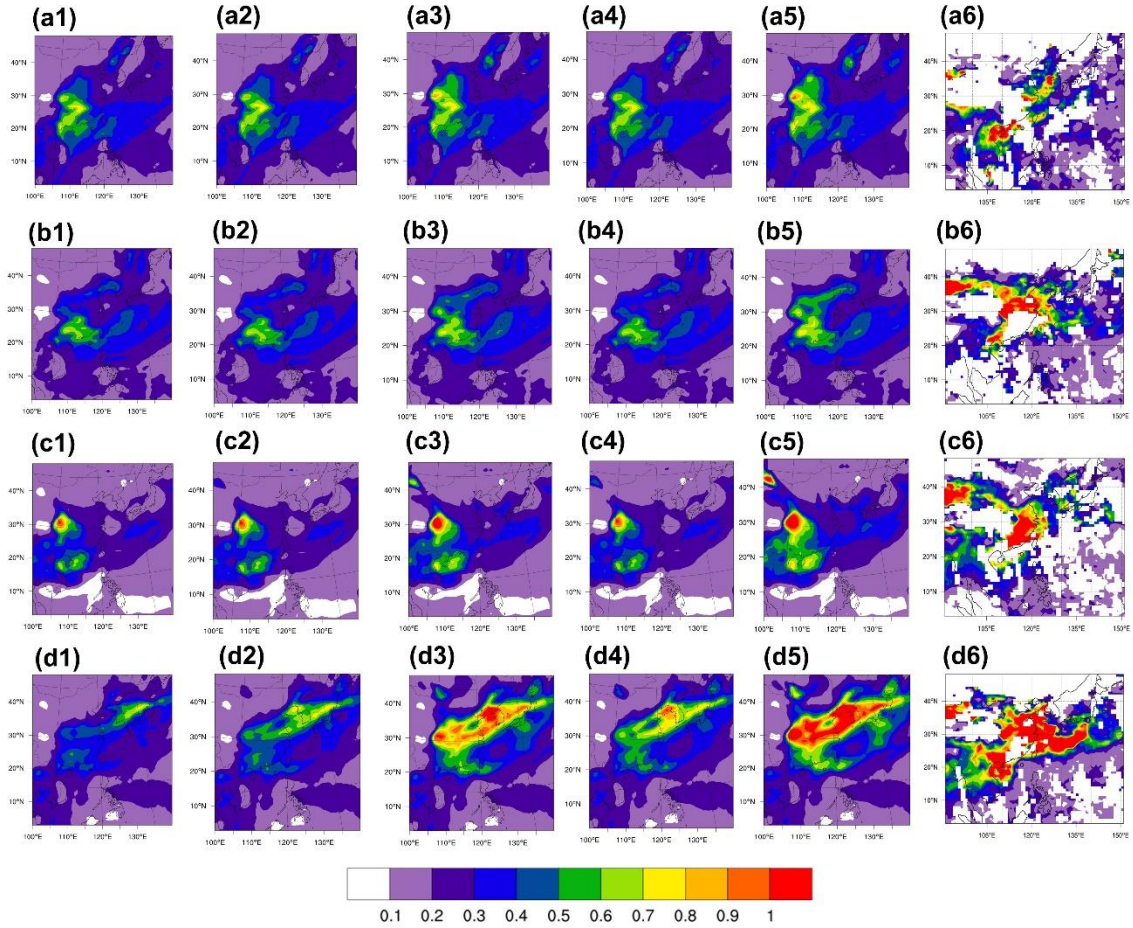


Figure S4: The three-day mean averaged AOD over East Asia region, for CMAQ (a1-a5, b1-b5, c1-c5, d1-d5) and MODIS (a6, b6, c6, d6) during 17-19 March 2005 (a1-a6), 18-20 March 2009 (b1-b6), 25-27 April 2009 (c1-c6) and 20-22 March 2010 (d1-d6).

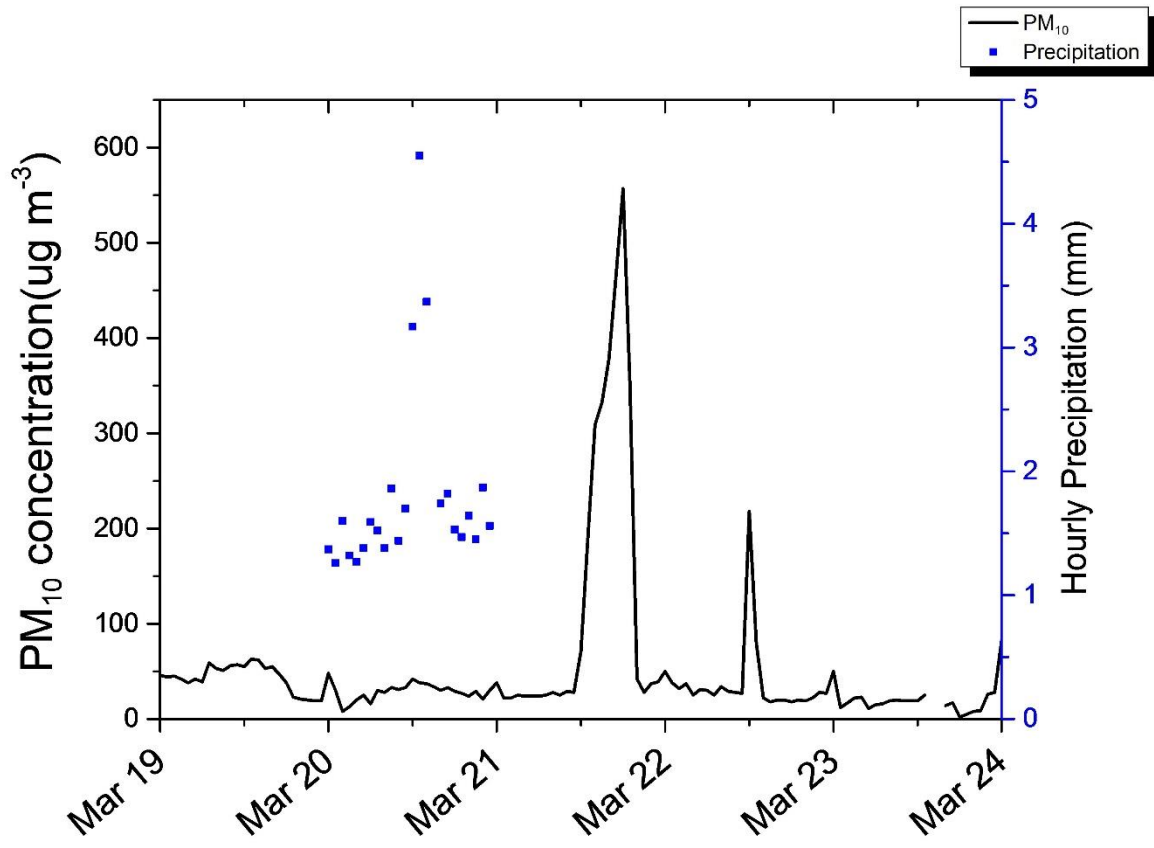
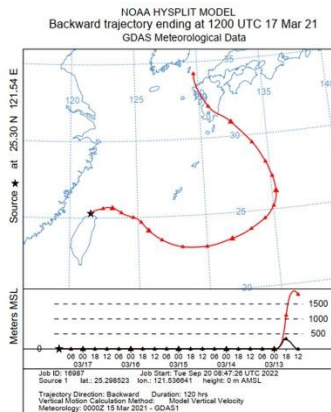
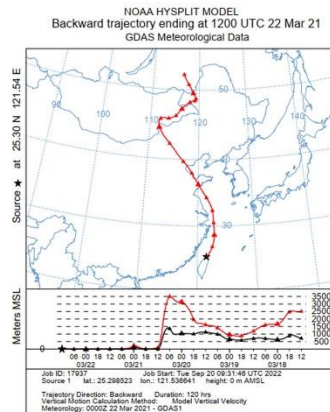


Figure S5: Hourly PM₁₀ concentration and precipitation from 19-24 March 2010 over Dongsha Island.

(a) 17 March 2021



(b) 22 March 2021



(c) 19 April 2021

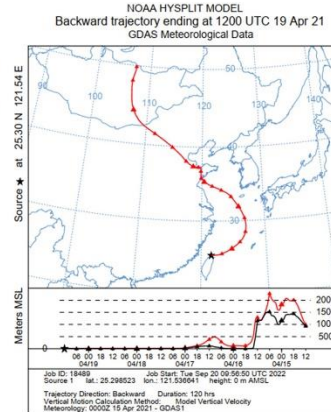


Figure S6: HYPLIT backward trajectory over Cape Fuguei on 00 UTC (a) 17 March 2021, (b) 22 March 2021 and (c) 19 April 2021.

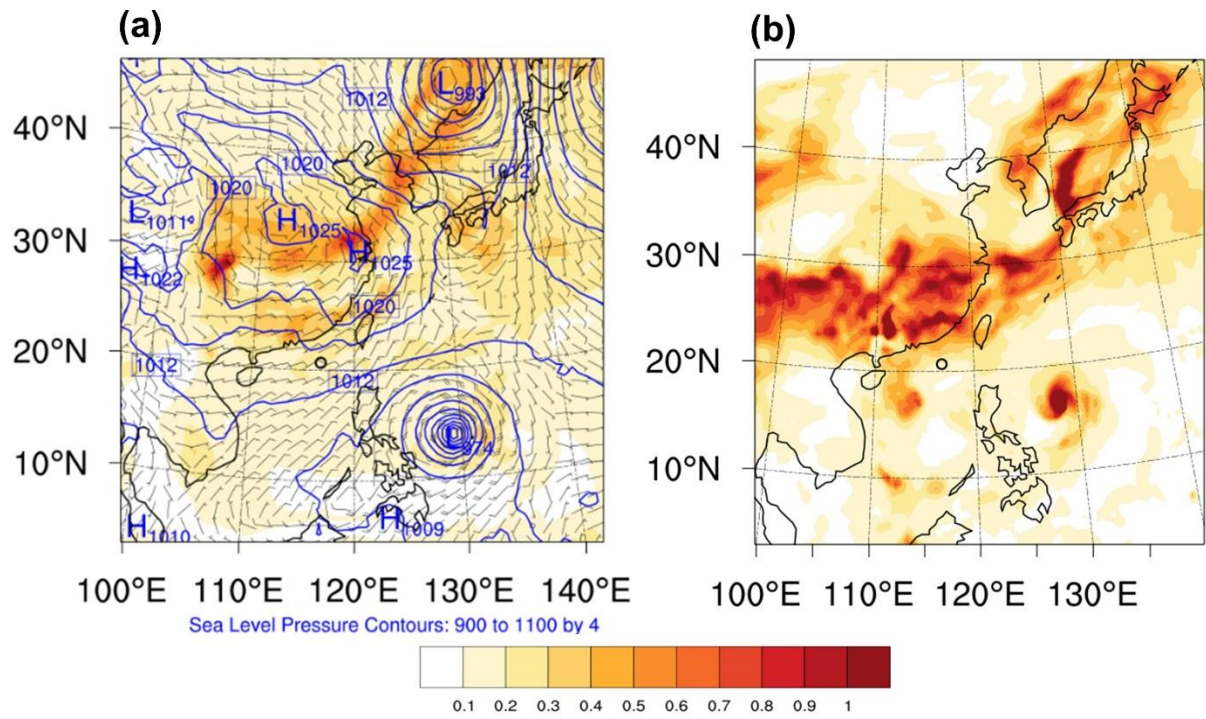


Figure S7: Spatial distribution of AOD at 550 nm for (a) CMAQ and (b) MERRA2 during 06 UTC 17 April 2022.