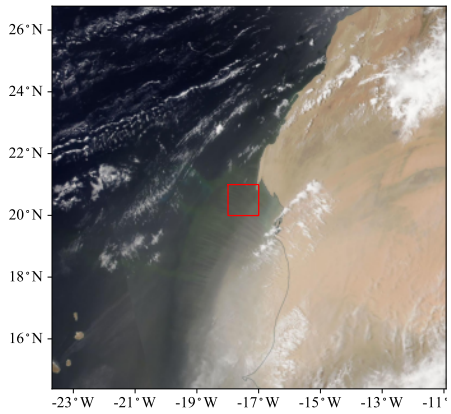


Figure S1: True-color VIIRS image recorded on 6 June 2020.

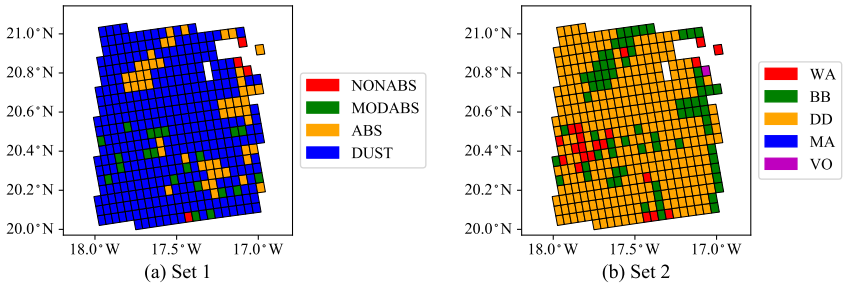


Figure S2: (a) The aerosol model with the highest evidence from Set 1, and (b) the aerosol type containing the aerosol model with the highest evidence from Set 2. The TROPOMI spectra were recorded on 6 June 2020.

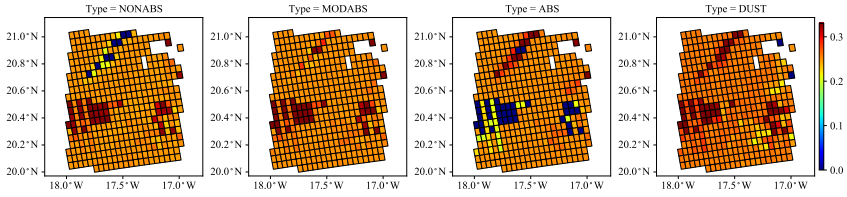


Figure S3: The model evidence for each aerosol model from Set 1. The TROPOMI spectra were recorded on 6 June 2020.

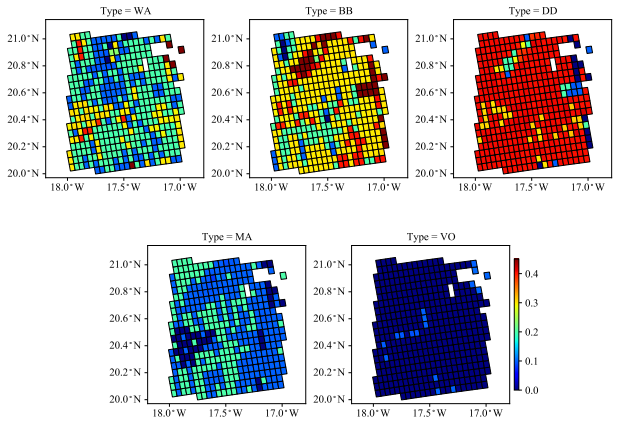


Figure S4: The sum of the first 10 best aerosol model evidences for each aerosol type from Set 2. The TROPOMI spectra were recorded on 6 June 2020.

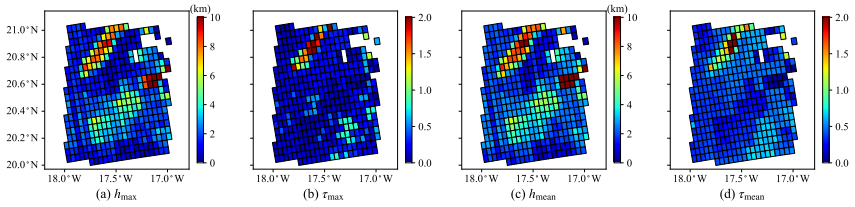


Figure S5: The maximum solution estimates ($h_{\max}$, $\tau_{\max}$) and the mean solution estimates (h_{mean}, τ_{mean}) for Set 1 and data on 6 June 2020.

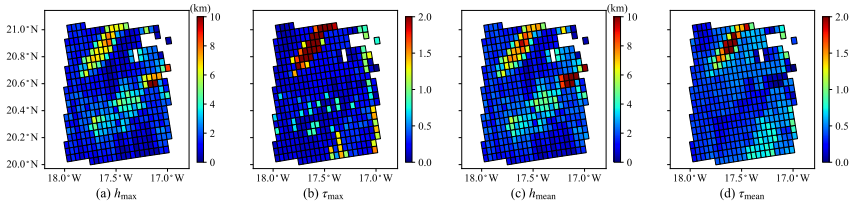


Figure S6: The same as in Figure S5 but for Set 2.

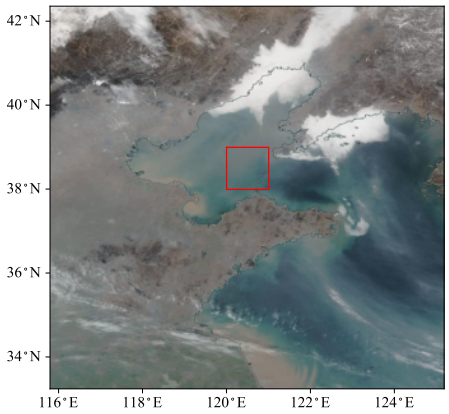


Figure S7: True-color VIIRS image recorded on 10 February 2020.

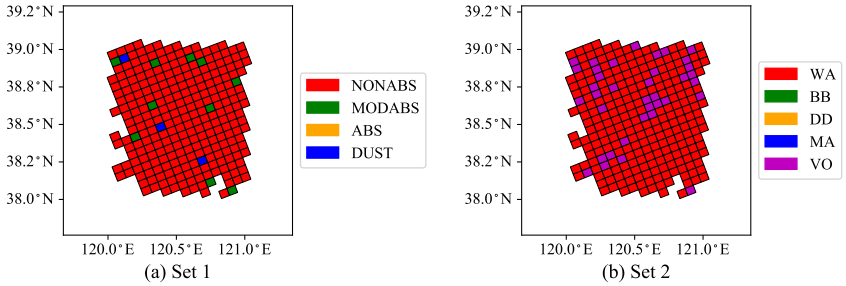


Figure S8: (a) The aerosol model with the highest evidence from Set 1, and (b) the aerosol type containing the aerosol model with the highest evidence from Set 2. The TROPOMI spectra were recorded on 10 February 2020.

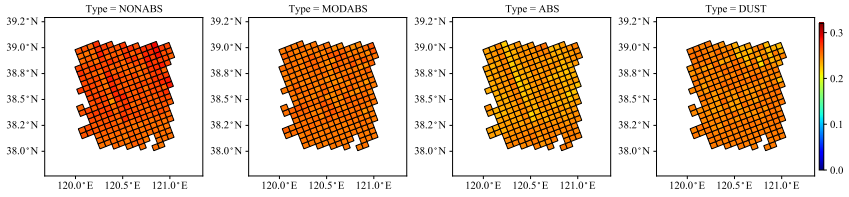


Figure S9: The model evidence for each aerosol model from Set 1. The TROPOMI spectra were recorded on 10 February 2020.

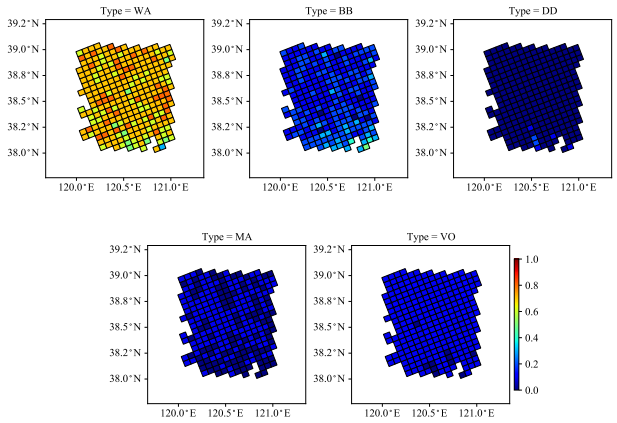


Figure S10: The sum of the first 10 best aerosol model evidences for each aerosol type from Set 2. The TROPOMI spectra were recorded on 10 February 2020.

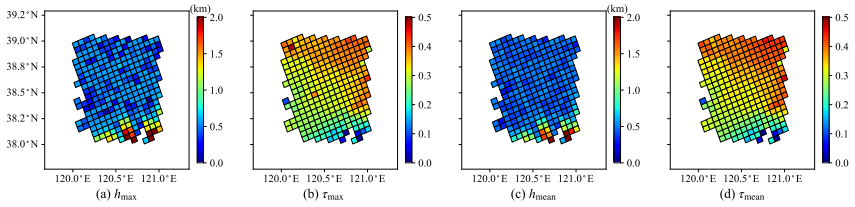


Figure S11: The maximum solution estimates ($h_{\max}$, $\tau_{\max}$) and the mean solution estimates (h_{mean}, τ_{mean}) for Set 1 and data on 10 February 2020.

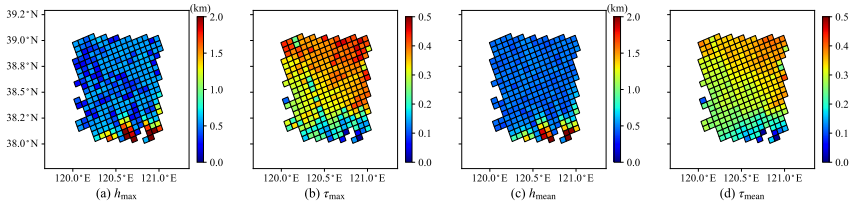


Figure S12: The same as in Figure S11 but for Set 2.