Table S1. Parameter settings used in the RTM in the simulation.

Parameters	
Type of radiative transfer model	scattered light in a spherical atmosphere
Target species	aerosol, NO_2
Wavelength (nm)	360
Single scattering albedo (SSA)	0.9
Asymmetry parameter (AP)	0.72
Surface albedo	0.06
Solar zenith angle (SZA, °)	60
Relative azimuth angle (RAA, °)	120
Elevation angles (EA, °)	Setting Ⅰ (10 EAs): 1, 2, 3, 4, 5, 6, 8, 15, 30, 90 Setting Ⅱ (6 EAs): 2, 4, 8, 15, 30, 90 Setting Ⅲ (6 EAs): 1, 2, 3, 4, 5, 90 Setting Ⅳ (6 EAs): 5, 6, 8, 15, 30, 90
Aerosol optical depth (AOD)	0.3
NO_2 Vertical column density (VCD, 10^{16} molec. cm^{-2})	1.0
Profile types and parameters	Exponential: $f_E(z) = A_E(h_E) \times \exp(\frac{-z}{h_E})$ with scale height h_E of 0.5 km; Gaussian: $f_G(z) = A_G(h_G, \sigma) \times \exp(\frac{-(z-h_G)^2}{2\sigma^2})$ with peak height h_G of 1.0 km, and the full width at half maximum (FWHM) σ of 0.5 km; Boltzmann: $f_B(z) = \frac{A_B(h_B)}{1+\exp(\frac{-(z-h_B)}{0.3})}$ with the effective profile height h_B of 1.5 km. The z is the altitude. The normalization factors A_E, A_B, and A_G were determined by numerical integration from 0 to 4 km altitude such that the integrals of f_E, f_G, and f_B were equal to 1. [22]
Pressure and temperature profiles	U.S. Standard Atmosphere (NASA, 1976) [44]
Vertical resolution of the input profile (m)	100, 200