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Effects of aerosol dynamics and gas–particle conversion on dry deposition of inorganic reactive nitrogen in a temperate forest

Genki Katata et al.

Correspondence to: Genki Katata (genki.katata.mirai@vc.ibaraki.ac.jp)

Supplemental Figures

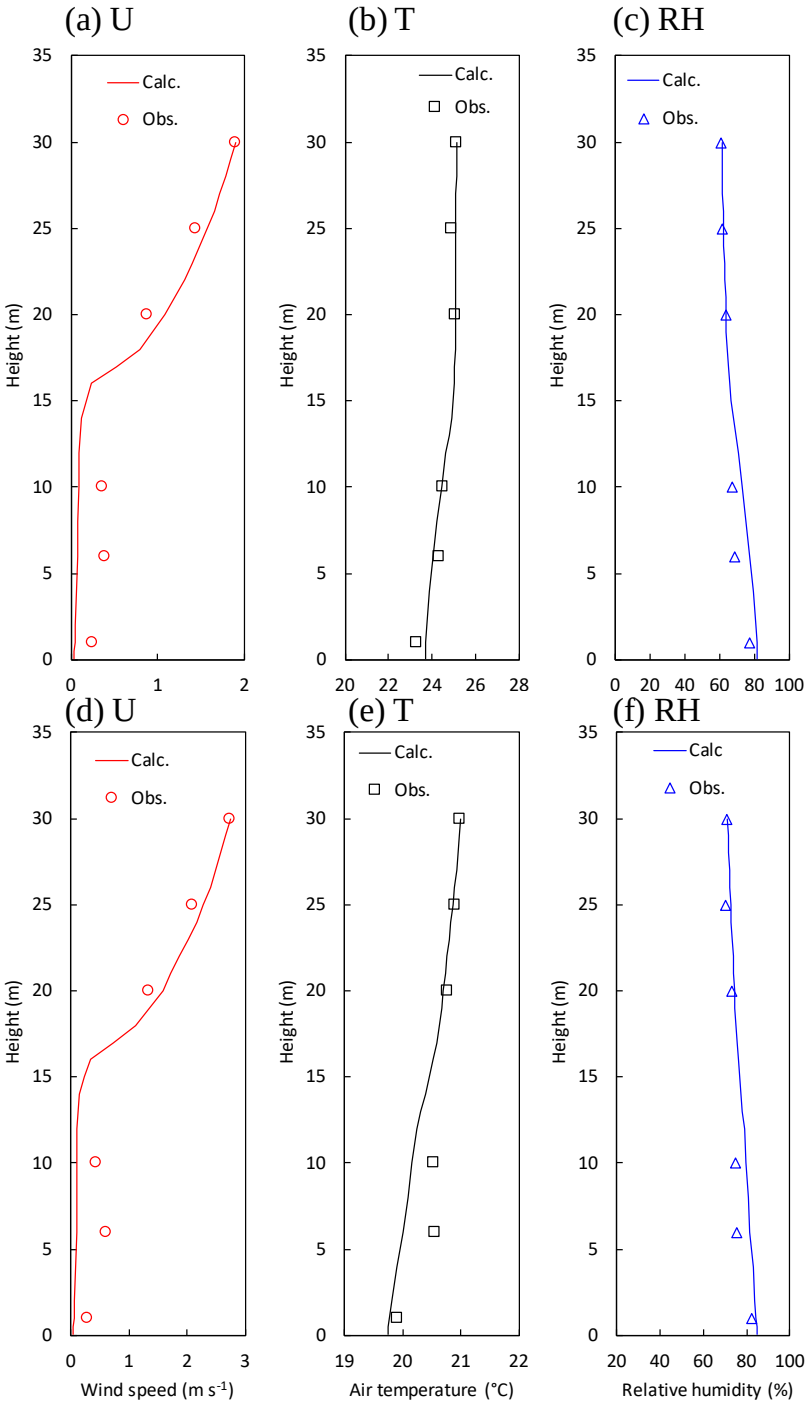

Figure S1. Mean vertical profiles in observed and calculated (a) wind speed, (b) air temperature, and (c) relative humidity in all simulation scenarios (a–c) during the daytime and (d–f) nighttime between 27 September and 11 October 2016 except for grey shaded areas in Fig. 6.

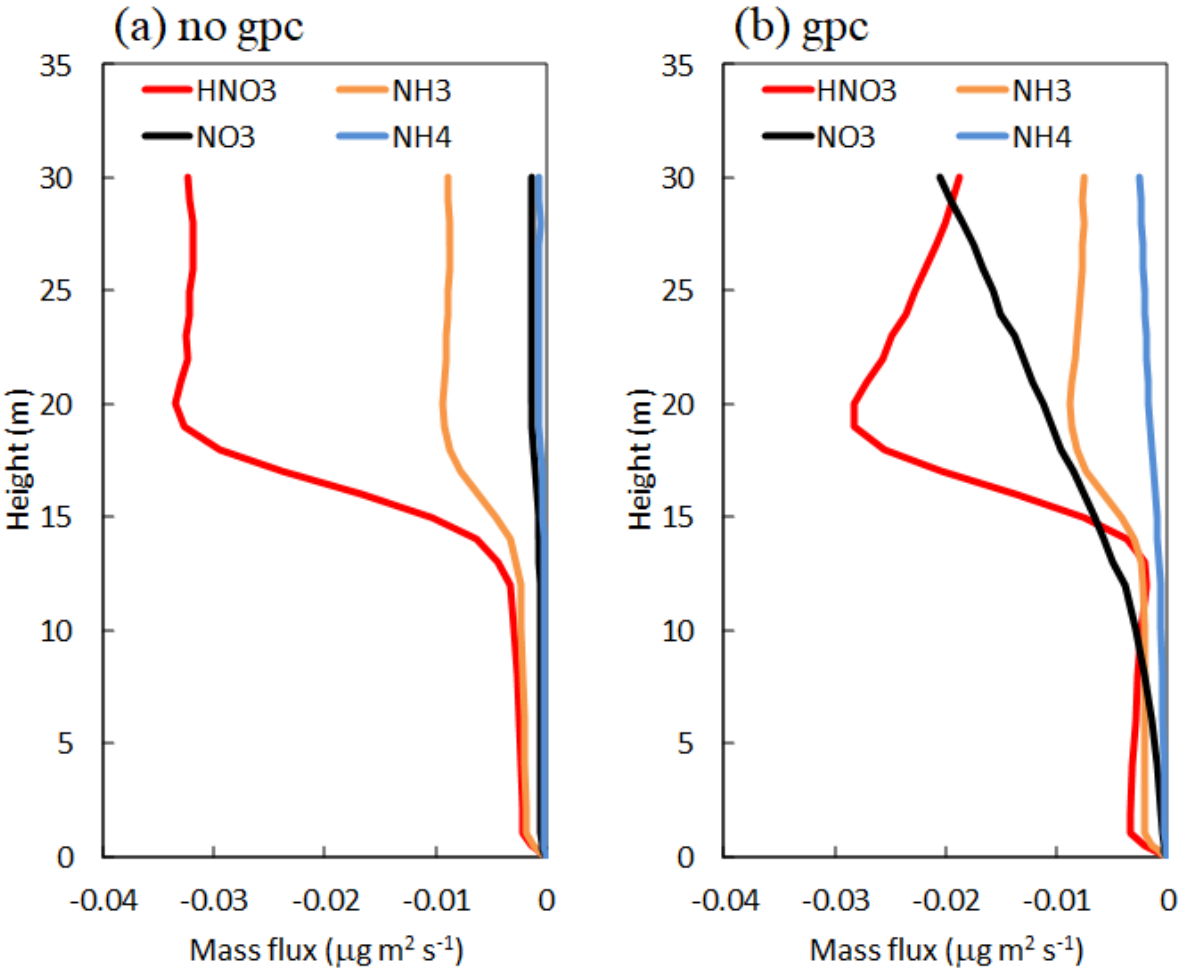

Figure S2. Mean vertical profiles in (a) calculated normalized mass flux in the "no gpc" scenario and (b) the "gpc" scenario for HNO_3 and NH_3 gases and NO_3^- and NH_4^+ fine particles during the daytime between 27 September and 11 October 2016 except for grey shaded areas in Fig. 6.

Supplemental Table

Table S1. Summary of simulation settings for the multi-layer atmosphere–SOiL–VEGetation model, SOLVEG.

Item	Value
Simulation periods	Early autumn (26 September to 11 October 2016); Late autumn: 7 November to 7 December
Time step	6 s
Vegetation species	Broad-leaved forest (*Quercus spp.*)
Numbers of layers	29, 20, and 7 for atmosphere, vegetation, and soil, respectively
Soil layer boundaries	0.02, 0.05, 0.1, 0.2, 0.5, 1.0, and 2.0 m depth
Vegetation layer boundaries	0.05, 0.1, 0.2, 0.3, and 0.5 m (understory vegetation), and from 1 to 20 m (forest canopy) with an increment of 1 m
Atmospheric layer boundaries	At the vegetation layers and from heights of 21 to 29 m in increments of 0.1 m
Root fraction distribution	Constant from the surface to 0.5 m depth
Characteristics length for leaf, d_{leaf}	10 mm
Number of particle size bins	30 bins from 0.003 to 3.5 μm in diameter
Porosity (saturated water content)	0.43 m^3 m^{-3}
Soil texture	Loam
Initial soil water content	0.5 m^3 m^{-3}
Leaf area index (LAI) of trees	4.3 (early autumn) and 3.6 m^2 m^{-3} (late autumn)
Other parameters	Same as Katata et al. (2014)

References

Katata, G., Kajino, M., Matsuda, K., Takahashi, A., and Nakaya, K.: A numerical study of the effects of aerosol hygroscopic properties to dry deposition on a broad-leaved forest, Atmos. Environ., 97, 501-510, 2014.