Supplementary material

Indirect radiative forcing by ion-mediated nucleation of aerosol

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Effects of ionization on [H_2SO_4], nucleation rates, and CN at different altitudes

In Figure 1 of the main text, we show the impacts of ionization on annual mean column burdens of H_2SO_4 vapor, column integrated nucleation rate (J), and total condensation nuclei (CN) number burden. Figure S1 gives the annual mean zonally averaged values of H_2SO_4 vapor concentration ([H_2SO_4]), J, and CN number concentrations for the two cases (IMN and BHN). Based on zonal averaged results, IMN reduces [H_2SO_4] al all altitudes and enhanced J and CN concentration almost at all altitudes except in the tropical upper troposphere above ~ 200 mb. The larger J for BHN case (compared to IMN case) in the tropical upper troposphere above ~ 200 mb is due to higher [H_2SO_4] and cold temperature there. There exists substantial difference in the vertical distribution of CN concentrations for IMN and BHN cases.

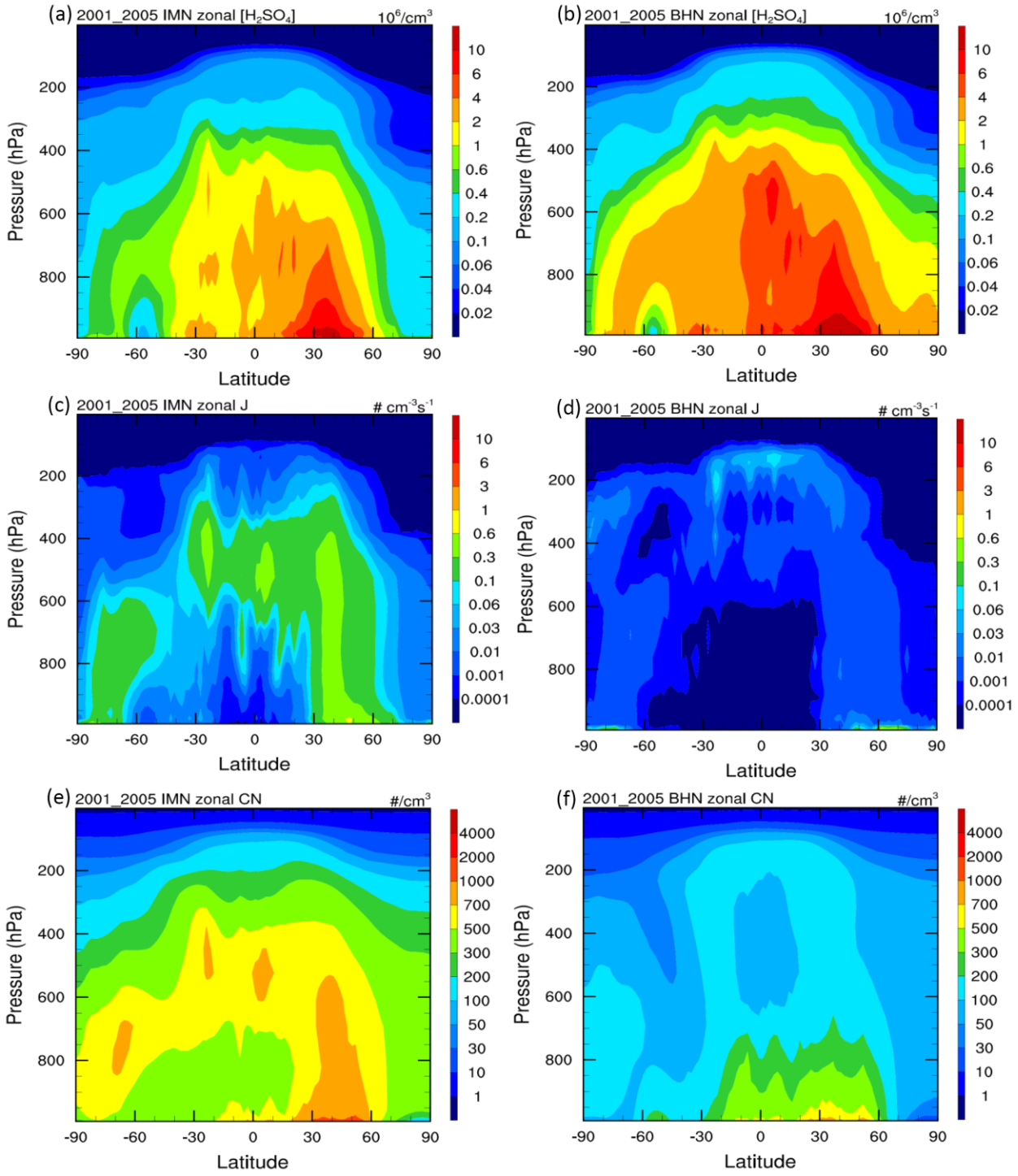

Figure S1. Annual mean zonally averaged values of H_2SO_4 vapor concentration, nucleation rate (J), and total condensation nuclei (CN) number concentrations based on IMN (a, c, e) and BHN (b, d, f).