

# Investigation of global nitrate from the AeroCom Phase III experiment

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## Main points:

- Nitrate is an important aerosol component and impacts on atmospheric chemistry, radiative forcing, and ecosystem.
- AeroCom Phase III nitrate experiment assesses the formation/loss processes for the atmospheric nitrate, ammonium and their precursors, participated by nine global CCM/CTM models.
- Analysis is conducted on a process-level including emission, dry deposition, wet deposition, thermodynamic chemistry, and heterogeneous chemistry.
- The model results are evaluated against various measurements from surface stations and NASA aircraft measurements.
- Atmospheric  $\text{NO}_3$  burden differs by up to a factor of 13, mainly due to the chemical mechanism for  $\text{HNO}_3$  production and the wet scavenging for  $\text{NH}_3$  removal, both are gas tracers and the precursors of aerosol  $\text{NO}_3$ .
- This assessment work reveals the diversity of nitrate simulation among the AeroCom models, and helps us understand the reasons causing the diversity.

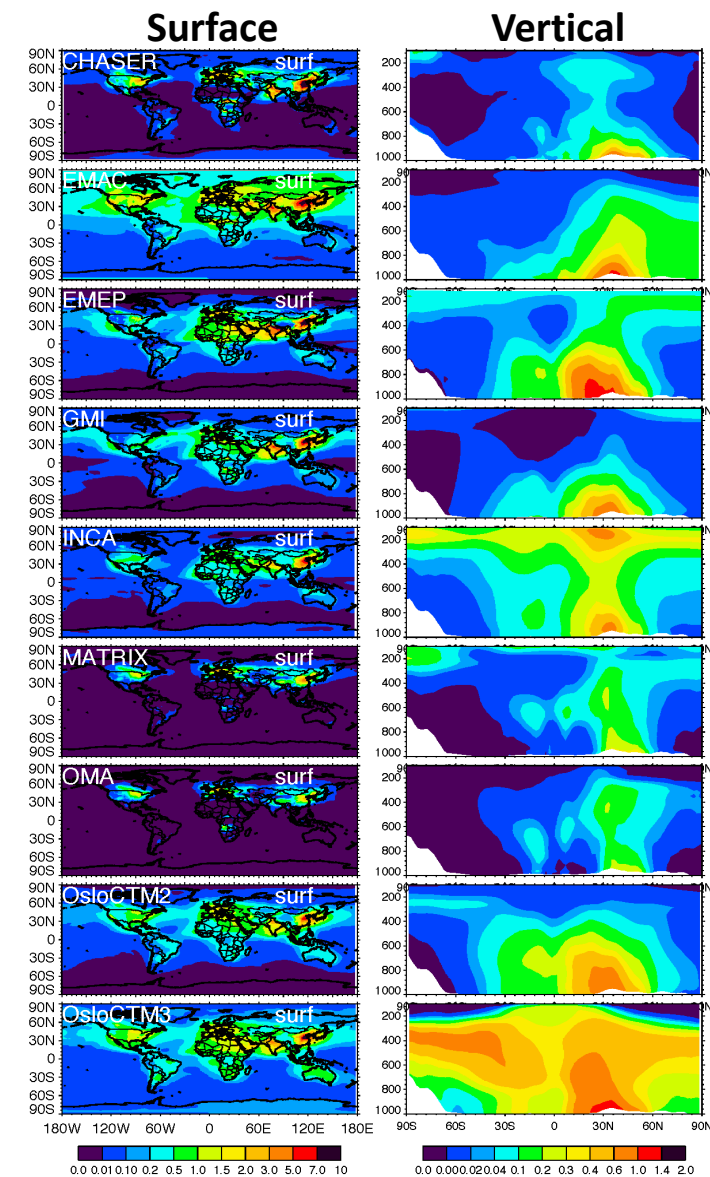


Figure shows aerosol  $\text{NO}_3$  surface ( $\mu\text{g kg}^{-1}$ ) and zonal mean vertical ( $0.5\mu\text{g kg}^{-1}$ ) mass mixing ratios from the AeroCom models.