

5.022 Radiative Forcing from Anthropogenic Sulfur and Organic Emissions Reaching the Stratosphere.

Early Career Scientist

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Abstract:

Aerosol and trace gases in the upper troposphere and lower stratosphere (UTLS) are important to the climate but still remain relatively less known to the science community. Recently NOAA-ESRL conducted a few field campaigns to study in-situ aerosol and size distribution in the UTLS of Asia and North America. A sectional aerosol model coupled with community earth system model is used to investigate stratospheric composition, size distributions, optical properties of aerosols. Our model can reproduce aerosols composition and size distribution in the global UTLS compared with multiple field campaigns and other datasets (e.g. Mauna Loa Lidar, University of Wyoming aerosol size distributions). We found organics makes up to 40% of global stratospheric aerosol budget. Based on our model, we provides estimation of radiative forcing coming from stratospheric non-volcanic aerosols (including both sulfate and organics) since 1850.