

4.078 A study on aerosol transport into upper troposphere and lower stratosphere and their impact on radiative and chemical processes with a global climate model.

Early Career Scientist

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Abstract:

Aerosols affect the radiation budget and chemical composition in the atmosphere. Among them, since the aerosols in the upper troposphere and lower stratosphere (UTLS) influence radiation, chemical and dynamical processes in the stratosphere, it is important for considering climate change. Recent satellite observations have shown an increase in the amounts of aerosols in the UTLS. The main reasons are considered to be due to deep convection by the Asian summer monsoon, volcanic eruption and large forest fires, but the transport processes from the aerosol sources and the climate impact of aerosols on the UTLS are not investigated quantitatively. This study examines the transport pathways of aerosols and its precursor gases to the UTLS using a global climate model, MIROC-SPRINTARS. Furthermore, we conduct sensitivity simulations with perturbing aerosol emissions from volcanoes, forest fires, fossil fuel to investigate the effects of aerosols on the climate through the radiative and chemical processes in the UTLS. These results will be shown in the presentation.