Exploring wildfire-derived aerosols from satellite and model simulations

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The wildfires occur frequently in the world wide scale. Consequently, large amounts of biomass-burning aerosols (BBAs) are released into the atmosphere. A number of reports indicate that BBA plumes have reached the free troposphere due to buoyancy from the intense fire. Aerosols injected at high altitudes significantly impact atmospheric chemistry and climate. However, the impact of explosive convection on the transport of atmospheric aerosol is not well quantified.

We have been involved in the analysis of severe BBA events for the past few years taking advantage of the Japan Aerospace Exploration Agency's Global Change Observation Mission-Climate (JAXA/GCOM-C) data, the chemical transport model (CTM) and radiative transfer simulations. JAXA/GCOM-C has a second-generation global imager (SGLI) on board. The SGLI is a 19-channel multispectral sensor with wavelengths ranging from near-ultraviolet (UV) to thermal infrared (IR), including red and near-IR polarization channels. Our recent work demonstrates that these features of the SGLI are useful for characterizing BBAs [1-5]. Also, CTM provide an effective means of estimating the effects of atmospheric aerosol distribution [6]. Here we mainly report our recent progress on the altitude characteristics of the BBA plume.

References

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