



ME Seminar



Radiation-aerosol interaction: Effect of trace gas, biomass burning and dust

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ABSTRACT

Aerosol optical depth (AOD) is the main parameter related to columnar integrated optical activity of aerosols which is the single most comprehensive variable to assess the aerosol load of the atmosphere and the most important aerosol-related parameter for radiative forcing studies. AOD by ground based measurements is obtained by sun photometers from direct sun measurements after accounting for atmospheric constituent's contributions. I investigated NO₂ (trace gas) absorption effect on AOD measurements by synergistic use of co-located spectroradiometers to see the deviations from satellite-based climatology. I also studied aerosol properties changes during atmospheric biomass burning during extreme weather event like wildfire activities that are increasing as a consequence of ongoing climate change due to more frequent heatwaves and intensified drought seasons. During a Canadian wildfire, I examined the observations that were unusual (rare) related to the observed AOD spectral feature and its consecutive impact on other aerosol properties of transported plume as observed from ground-based aerosol remote sensing and in situ measurements. I also studied the Greek wildfires of 2021 that had an impact on air quality and surface spectral solar radiation which I analysed using active and passive remote sensing instrumentation as well as radiative transfer modelling. Apart from this, I investigated the role of the presence of aerosol layer such as dust layer in the atmosphere on the incoming solar radiation that I investigated using regional Numerical Weather Prediction model for solar irradiance forecasting with AOD forecast ingestion.

ABOUT THE SPEAKER

Dr. Akriti Masoom is a NASA postdoctoral program fellow at Goddard Space Flight Center in United States. Prior to this, she was working in Switzerland as a postdoc in PMOD World Radiation center. She graduated in Mechanical Engineering and did her postgraduation from the Indian Institute of Technology (Bombay and Roorkee). Her research expertise is in radiative transfer in the atmosphere. She has worked with ground-based instrumentation dealing with aerosol remote sensing and gaseous absorption. She has studied atmospheric combustion related to biomass burning during wildfires and one of a rare aerosol properties observation during a wildfire event. She has also worked with Weather Research and Forecasting model for solar irradiance forecasting and have been pursuing climatological studies. Apart from the core scientific activities, she has been part of a European Union project Cost Action Harmonia as working group 1 co-leader dealing with activities related to homogenization of aerosol measurements.



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