ATS/CIRA Colloquium

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Exploring Chemical Complexity in Biomass Burning Emissions and Air Quality Models

Hosted by Jeff Pierce

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ATS room 101; Discussion will begin at 11:15am
Refreshments will be served at 10:45am in the weather lab

Biomass burning (BB) is the second largest global emissions source of non-methane organic compounds (NMOCs). Chemical transformations of emitted NMOCs lead to the production of ozone (O3) and secondary particulate matter (PM), thereby affecting air quality and climate. Until recently, a significant mass fraction of NMOCs in BB emissions (up to 80%) has remained uncharacterized or unidentified. Models used to simulate the air quality impacts of BB thus have relied on very limited chemical characterization of the emitted compounds. Recent application of advanced analytical techniques have enabled identification and quantification of an unprecedented fraction of BB NMOCs. In this work, BB emissions profiles have been updated using these recent data; the sensitivity of predicted precursor and pollutant concentrations to differences in emission speciation profiles have been evaluated. The updated BB emissions speciation profiles lead to markedly different surrogate compound distributions than the default speciation profiles. Box model results suggest that these differences are likely to affect predictions of PM and important gas-phase species in chemical transport models. In addition, the consequences of using conventional approaches for mapping individual compounds to model surrogates are being investigated and alternative approaches are being considered. This presentation will focus on these current research results and the potential for further BB emissions characterization studies, with concerted model development efforts, to improve the accuracy of BB predictions.

Link to colloquium videos and announcement page: http://www.atmos.colostate.edu/dept/colloquia.php