NCAR

Atmospheric Chemistry Observations & Modeling Laboratory

SEMINAR

Emissions of glyoxal and other carbonyls from biomass burning

Kyle Zarzana

University of Colorado – Boulder

Biomass burning emissions are a complex mixture of gases and particles that can directly affect numerous atmospheric processes, such as ozone and PAN production and aerosol formation. Modeling of fire plume chemistry has indicated that carbonyls can play a large role in ozone and PAN formation, and it has been suggested that small alpha-dicarbonyls such as glyoxal and methylglyoxal can play a role in SOA and brown carbon formation. Additionally, since glyoxal and formaldehyde can both be detected from satellites, the ratio of these two molecules has been proposed as a metric for examining the chemistry of volatile organic compounds from space. Biomass burning and biofuel use are believed to contribute roughly 20% of the glyoxal budget, but only 3.5% of the methylglyoxal budget. However, previous laboratory measurements of glyoxal and methylglyoxal emissions only examined a limited number of fuels and used a method that is now known to have significant interferences from unrelated species such as NO2.

In this talk I will discuss measurements of glyoxal and methylglyoxal made from the NOAA WP-3D aircraft during the 2013 Southeast Nexus (SENEX) and 2015 Shale Oil and Natural Gas Nexus (SONGNEX), as well as more recent laboratory measurements made at the US Forest Service Fire Sciences Laboratory during 2016 as part of the Fire Influence on Regional and Global Environments Experiment (FIREX). These measurements were made using cavity enhanced spectroscopy, which provides both greater selectivity and sensitivity than previous methods. 17 biomass burning plumes were intercepted during the 2013 SENEX and 2015 SONGNEX campaigns, while a total of 75 burns, comprising 33 unique fuels, were examined during FIREX, providing the most detailed look to date at glyoxal and methylglyoxal emissions from fires.

Monday, October 15, 3:30 p.m

Refreshments 3:15 p.m

NCAR Foothills Laboratory

3450 Mitchell Lane, Boulder, CO 80301

FL-1022, Large Auditorium

Live webcast: http://ucarconnect.ucar.edu/live

For more information please contact Bonnie Slagel, bonnie@ucar.edu, phone 303-497-8318.