Abstract – E. Yates

Title: Western US tropospheric ozone: An assessment of vertical and seasonal variations over California and Nevada

In the rural western US free-tropospheric O3 has risen in recent years as a result of rising Asian emissions, deep stratospheric intrusions and more frequent wildfires. This increasing O3 trend combined with the high surface elevation of much of the western US, which aids mixing between boundary layer and free-troposphere, pose challenges in attaining the more stringent O3 National Ambient Air Quality Standard (NAAQS) at many western US rural surface sites. As such, the ability to identify various sources and transport mechanisms that contribute towards surface O3 is increasingly important.

This paper analyzes vertical profiles of O3 from the Alpha Jet Atmospheric eXperiment (AJAX) over California and Nevada, ozonesondes from Trinidad Head, CA and tropospheric ozone profiles from the differential absorption lidar (DIAL) at the JPL Table Mountain Facility, CA. Surface O3 from the US EPA Clean air Status and Trends Network (CASNET) are used to discuss surface trends. GEOS-Chem determines the trends in regional O3 and assess the contributions of various sources on surface O3. And Realtime Air Quality Modeling System (RAQMS) is used to forecast and interpret free-tropospheric observations. Specifically we will address the following questions: What are the effects of the lowered NAAQS? Do we observe elevated O3 during 2012 at surface sites reported in previous studies? And if so, what are the causes? How variable is free-tropospheric O3 over California and Nevada? How frequently do we observe high O3 lamina in the free troposphere and what are the surface impacts?