​**Measuring Heavy Duty Vehicle Emissions using CARB Portable Emissions AcQuisitions System (PEAQS): Roadside Plume Capture Method and Implementation of Real-Time VOC Quantification.** M.R. Olson, CARB, Sacramento, California; D. Phillips, CARB; O. Park, CARB; S. Hu, CARB; T. Huai CARB

CARB’s road-side plume capture method, the Portable Emissions AcQuisition System (PEAQS), offers the unique ability to characterize a snapshot of real-world emissions from a large number of individually identified vehicles at multiple locations in Northern California. The configuration of these systems introduces a number of challenges when deployed in the field, such as dilution impacts, plume capture efficiency, and plume interferences, however the large number of vehicles tested allows a statistically robust estimate of emissions from different fleet groups (e.g. model year, manufacture, vocation, etc.). PEAQS can be deployed with various levels of analytical capabilities. Simple systems are deployed to measure CO2, NOx, and black carbon (BC) only, while advanced, trailer-based, systems allow measurement of extensive and configurable set of emissions (e.g. NO2, N2O, Ammonia, VOCs and NMHC, Brown Carbon, and PM). The presentation will describe PEAQS methodology and highlight results from recent PEAQS deployments. Finally, the presentation will describe the future capabilities of applying real-time VOC measurements using PTR-ToF-MS. The goal will be to quantify Mobile Source Air Toxics (MSAT) and identify both individual vehicles and fleet groups which emit these compounds at higher rates than the majority of the fleet. Examples of compounds that may be measured include: Formaldehyde, Ethylene, Acetaldehyde, Propylene, Benzene, Butyraldehyde, and Methyl ethyl ketone. Other VOC compounds will be investigated using non-targeted capabilities of the PTR-ToF-MS, offering the ability to assess air toxics, greenhouse gasses, and ozone pre-cursers.