



UAS Operations at EPA/ORD

Focus: Emissions Sampling and Plume Dispersion

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Office of Research and Development
Center for Environmental Measurements and Monitoring

Background: EPA UAS Status

- ▶ EPA recently signed its UAS Policy Directive
 - ▶ Use of UAS
 - ▶ Data Management, Security
 - ▶ Privacy, Civil Rights
 - ▶ Financial Mechanisms
- ▶ EPA is NOT allowed to own or pilot “aircraft”
 - ▶ Flights with grantees, contractors, or other agencies are okay
- ▶ EPA use of UAS has been minimal but is increasing

Use of UAS for Emissions Sampling

19 campaigns since 2015 using UAS with:

- ▶ NASA, USGS, USCG, SERDP, US Army, NOAA, DOI/BSEE, DRI, UNC/Atollo



ORD Kolibri aboard USGS UAS

Sampling detonations in New Mexico for US Army



USFS flights at a wildland fire



Sampling in Mobile Bay AL with USCG



Sampling in KS Flint Hills with USGS

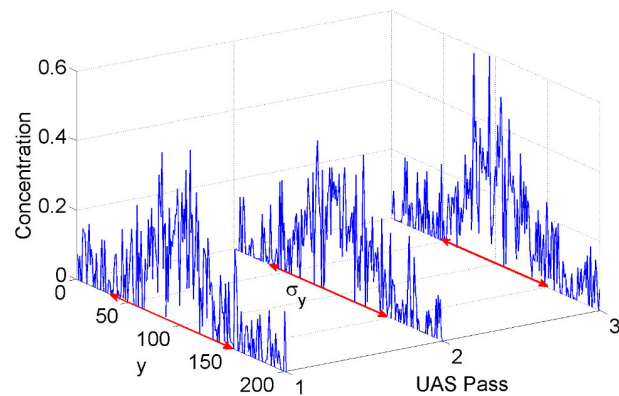


Upcoming Plume Dispersion Project

A UAS equipped with a gas/particle sampler will obtain real time emission concentrations as a function 3D spatial and temporal coordinates.

These values will be used to calibrate a dispersion model (HYSPLIT) to inform On Scene Coordinators about plume direction for protection of workers and the downwind public.

The mobility of the UAS to conduct plume transects allows unprecedented gathering of these data for evaluation and refinement of dispersion models.



FAA waivers may be required for >400' AGL and operation beyond visual line of sight

Upcoming Plume Dispersion Project - continued

This work is proposed to be conducted at the University of Alaska - Fairbanks, Poker Flat Research Range.

Oil burns on water will produce the plume for UAS-based measurements.

Partners in this project include EPA/ORD, DoI/BSEE, EPA/OEM, NOAA/ARL, USGS/IC, and USGS/NUPO.

Other partners are encouraged, particularly in the area of meteorological measurements.

Atmospheric conditions comprise critical components of the model, including, among others:

- Temperature lapse rate
- Wind velocity with elevation
- Turbulence with elevation



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