

Unmanned Aerial Vehicle (UAV) Based Measurements of Ice Clouds and Environment Related to Rocket Launch Exhaust Plume (UAV-REP)

Technology Need

Current state of the art are large instruments deployed on costly piloted research aircraft.

There is a need for smaller, integrated systems capable of more remote deployment that can target specific high-altitude locations.

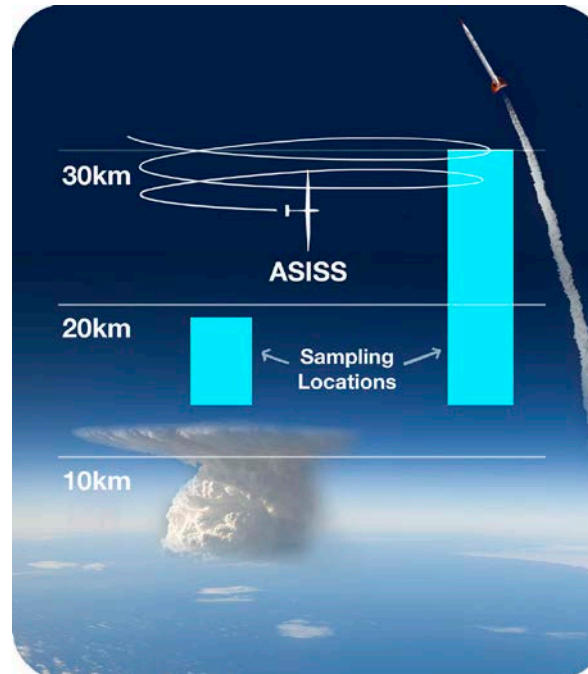
The proposed, multi-instrument sensor payload has the potential to offer new, time critical observations contributing valuable launch data to the new space economy.

Technology Concept

An autonomous System for In-situ Stratospheric Sampling (ASISS) is a new, all-in-one instrument suite/platform for observing atmospheric state parameters, aerosols and ice particles, and their extinction, which is currently at TRL of 5 having previously flown through boundary layer fog and cloud systems.

Test Apparatus

The hybrid, balloon launched, stratospheric glider and custom, in-situ weather and hydrometeor instrument suite has a combined weight of 18.5lbs, a wing-span of 12.8 ft and a fuselage length of 10 ft. Platform has lithium battery power for the payload, avionics and telemetry, and a parachute equipped with GPS and geofencing capabilities.



Flight Requirements/Objectives

Three-week field project at Cape Canaveral during peak thunderstorm weather with a 3-person crew from the proposer organization and a 3-person crew from the flight provider.

- 1.) Conduct ice, aerosol, and extinction sampling above, and through, thunderstorms to characterize environment.
- 2.) Conduct local and long distant rocket exhaust sampling, pre- and post-launch.

Technology Advancement

The ability to quickly sample, retrieve and repeat both pre- and post-launch in a stratospheric, operational environment will move to this new, combined sensor suite to TRL 8.

Technology End Users

Researchers need quick and repeatable, high-altitude sampling to study cloud processes, climate change and rocket launch induced environmental changes, which include NASA's airborne science program, NOAA's Extreme Weather Office and launch providers.