

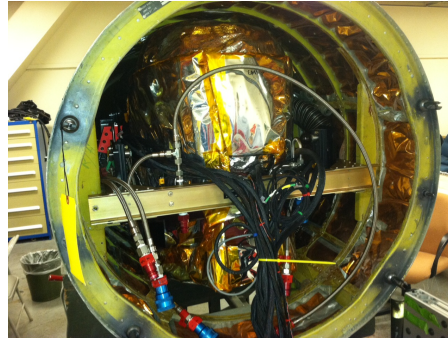


Integration of Cloud-Aerosol Transport System (CATS) to High-Altitude Research Aircraft

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Objective

- Integrate CATS instrument to ER-2 aircraft to provide demonstration of measurement capability in support of the Aerosols-Clouds-Ecosystems (ACE) and 3D Winds missions.
- Fly CATS with existing Cloud Physics Lidar (CPL) to provide full demonstration for ACE lidar concept (three backscatter wavelengths at nadir with depolarization plus high spectral resolution/Doppler capability off-nadir).
- Enable evaluation of potential alternate approach for ACE lidar, including assessment of scalability for spaceborne application.



CATS instrument installation in ER-2 superpod
Left: integrated in the forward superpod
Right: final check and fit before flight

Accomplishments

- Integrated the CATS instrument to the ER-2 aircraft.
- Demonstrated nominal operation in engineering test flights, especially critical thermal control subsystem.
- Obtained agreement in data quality with CPL backscatter measurements.
- Implemented in-flight etalon calibration routine and automated azimuth scanning.
- Obtained >50 flight hours of data (17 flights) for testing/debugging of hardware and science data collection.
- Used data from flights to show measurement scalability to spaceborne (CATS-ISS) performance.

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