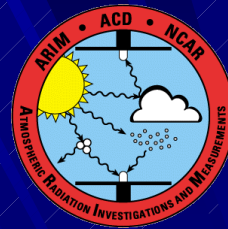


CCD Actinic Flux Spectroradiometers (CAFS)



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Measurement: Upwelling, downwelling and total actinic flux

Output: Photolysis frequencies based on cross-section and quantum yield calculations

O₃, NO₂, CH₂O, HONO, HNO₃, N₂O₅, HO₂NO₂, PAN, H₂O₂, CH₃OOH, CH₃ONO₂, CH₃CH₂ONO₂, CH₃COCH₃, CH₃CHO, CH₃CH₂CHO, CHOCHO, CH₃COCHO, CH₃CH₂CH₂CHO, CH₃COCH₂CH₃

Calibrations

- Absolute spectral sensitivity (primary, field)
- Wavelength assignment
- Angular azimuthal response of optics

Research areas

- Chemical evolution in pollution plumes
- Tropospheric oxidant chemistry
- Effects of Arctic haze, boreal fires emissions and surface deposited black carbon on photochemistry

Wavelength Range	280-680 nm limited by cutoff filters
Wavelength Resolution	~1.8 nm FWHM at 297 nm
Spectral Precision	1-2 % depending on wavelength
Spectral Accuracy	5% in UV-B, 3% in UV-A/VIS limited by NIST standards
Detection Limit	~0.04 mW/m ² /nm at 300 nm
Data Rate	0.2 Hz
Weight	< 18 kg / instrument
Power	2.5 A of 115 VAC
Rack Height	20 cm
Optical Locations	DC-8 Zenith 1 and Nader 7 ports

CAFS Operation Requirements:

- No large or reflective physical obstructions to hemispherical optics
- Reasonably maintained cabin temperature (<30 C)
- Suitcase Flights:
 - 1 seat for transits (none for any local flights).
 - 1 80 lb calibration box for transits (none for any local flights)

Flight planning:

- Low altitude flight legs over snow, ice, open water and boreal forest
- Level flight legs above and below cloud and pollution layers