

MILAGRO Measurement Comparison

Gao Chen – NASA Langley

Frank Flocke – NCAR

Bill Brune – Penn State

Stephen Springston – DOE BNL

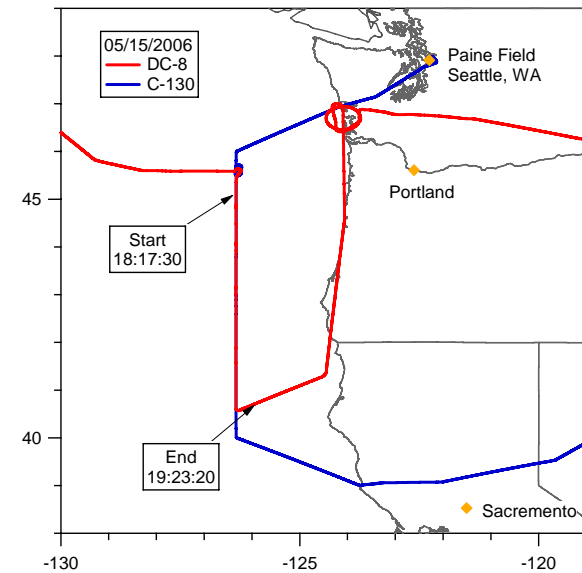
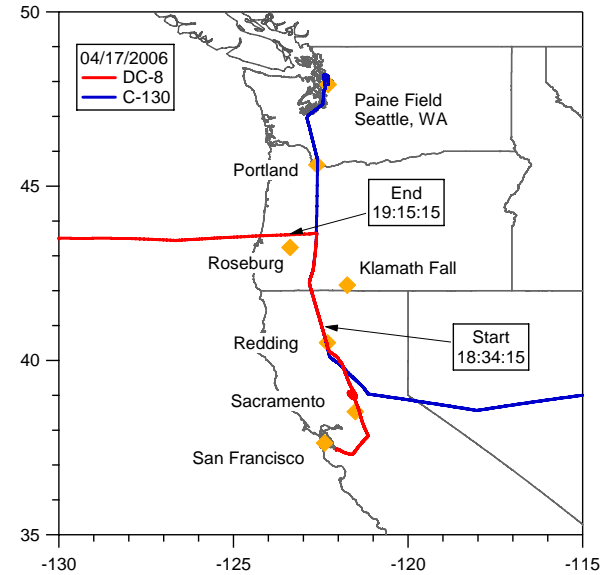
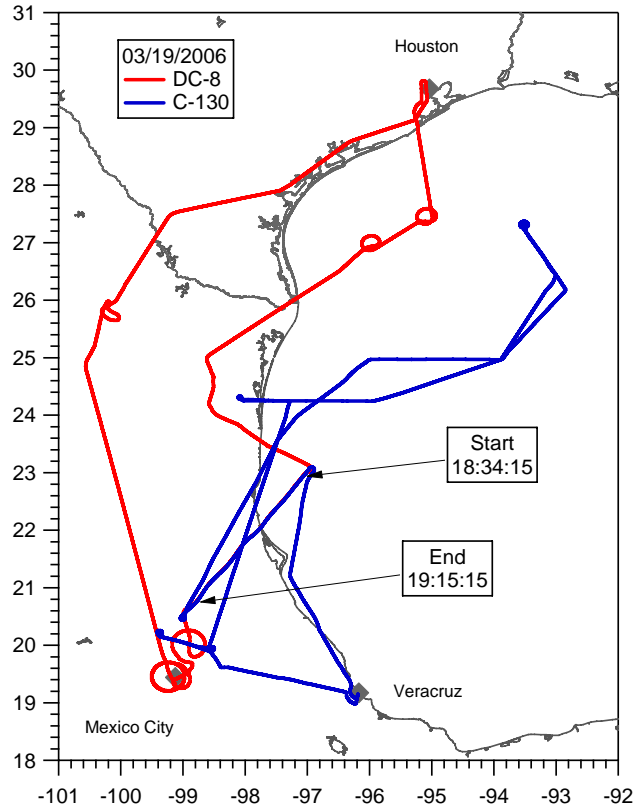
Jim Crawford – NASA Langley

Objectives

To help generate a unified MILAGRO database.

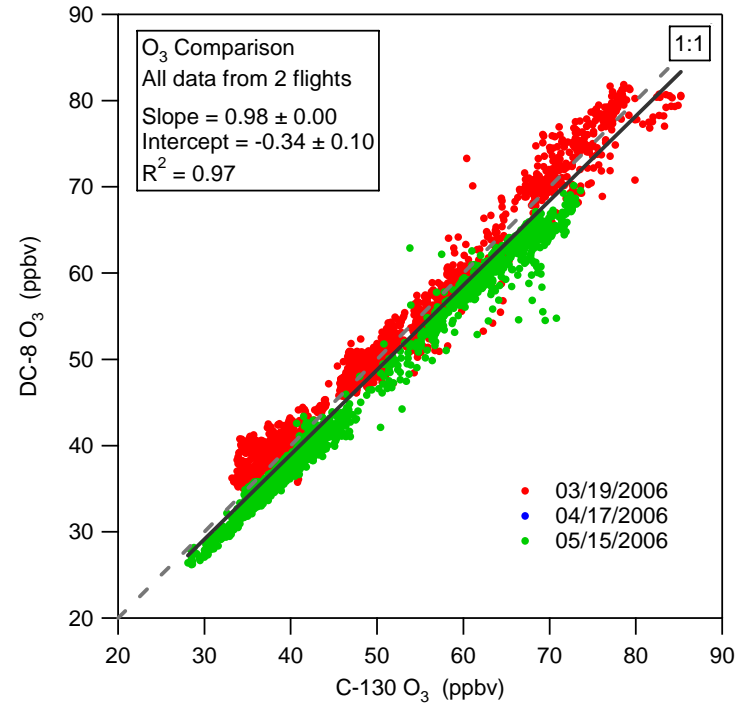
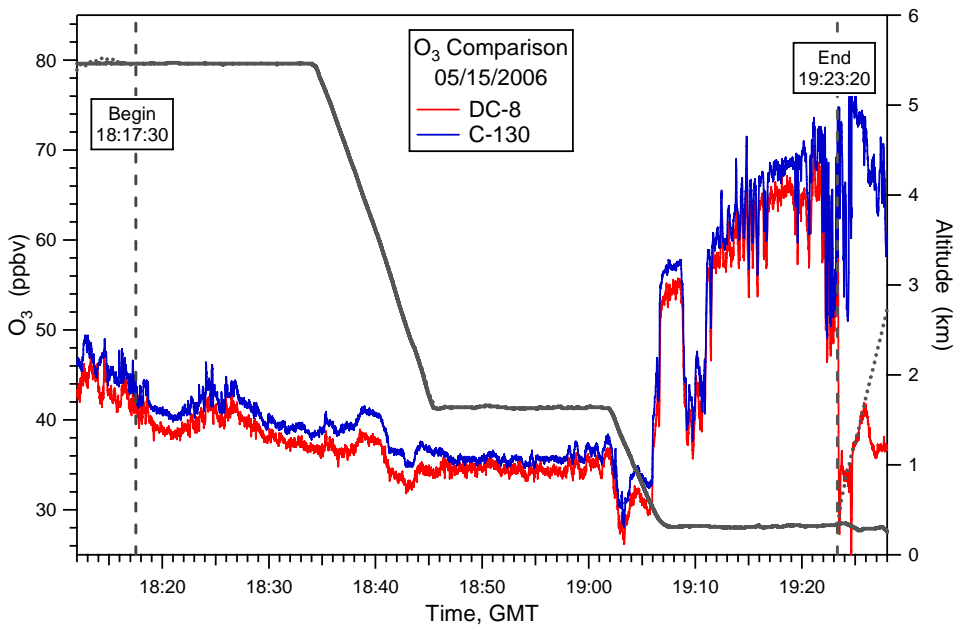
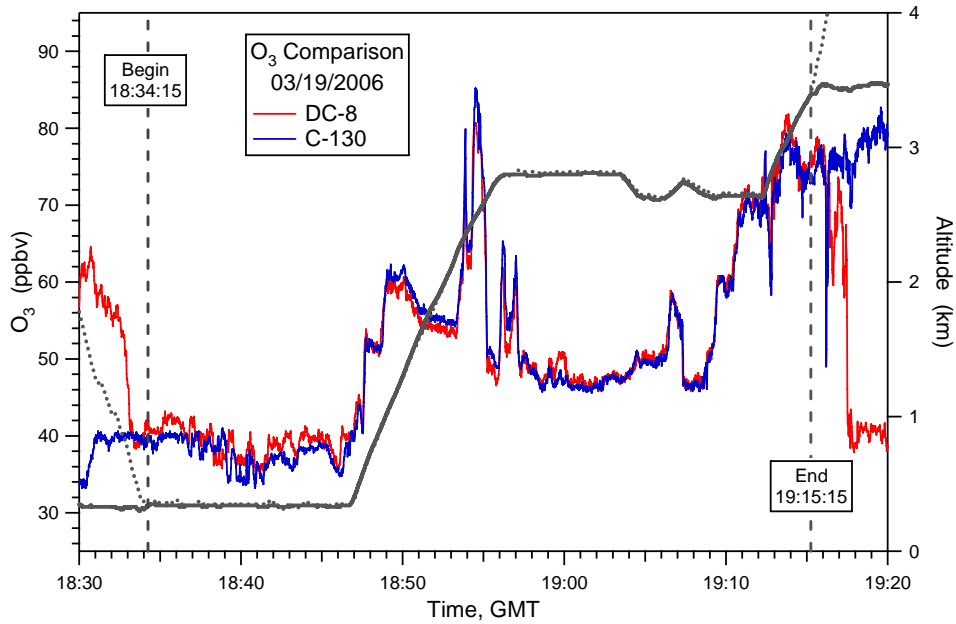
- To objectively assess the measurement uncertainties.
- To assess the measurement consistencies in the context of previous intercomparisons.

NSF C-130 vs. NASA DC-8 Flight Tracks



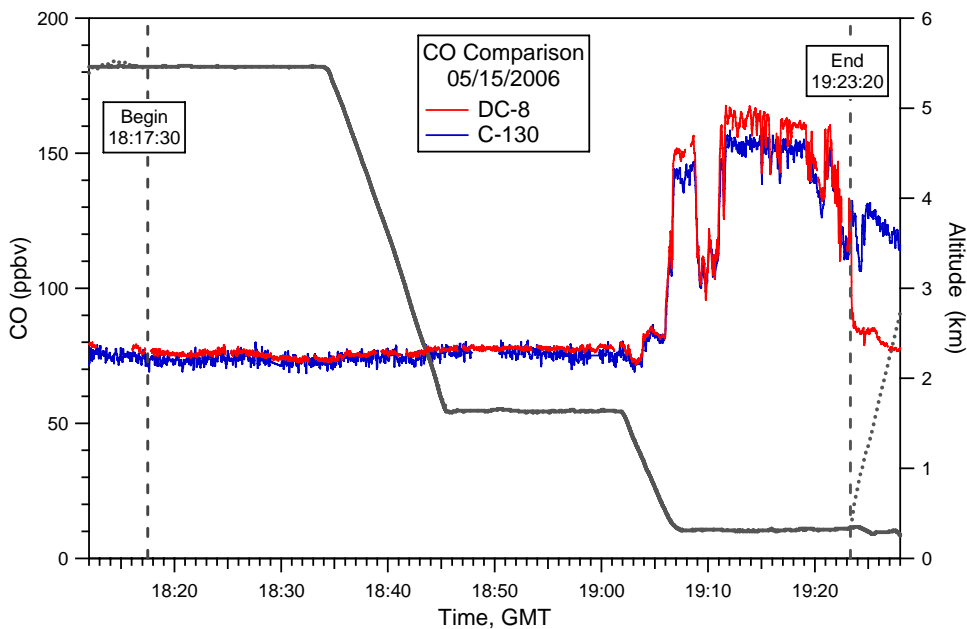
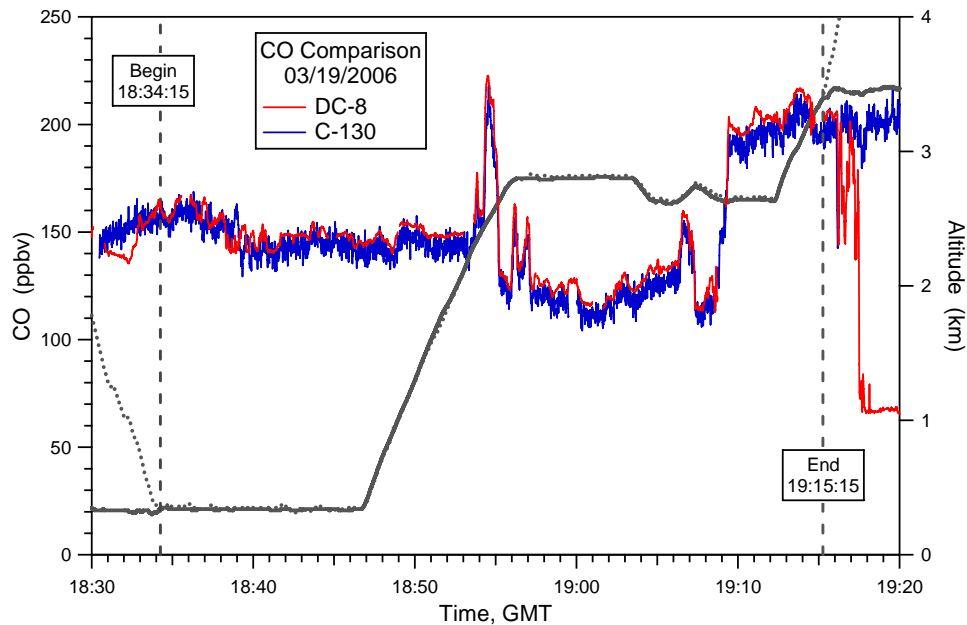
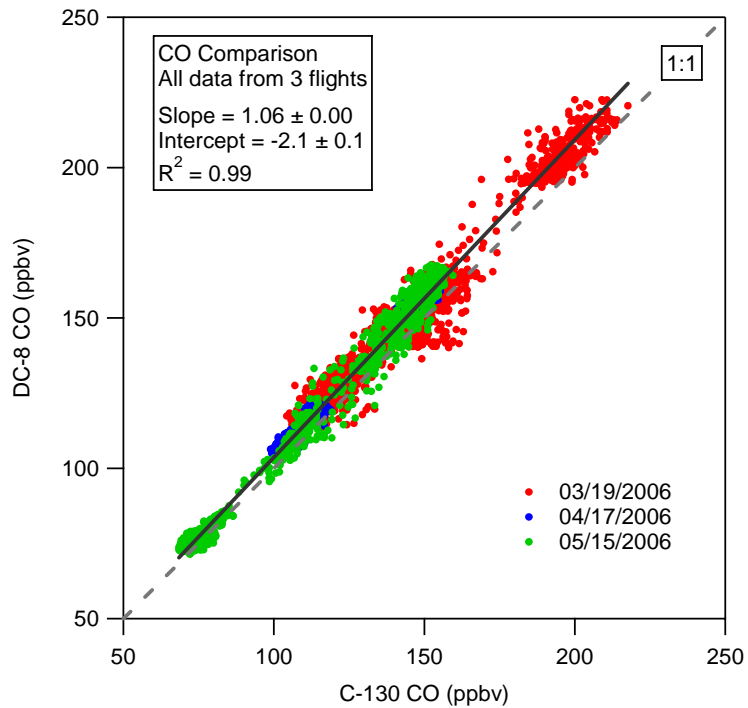
O₃ Comparison

NSF C-130 vs. NASA DC-8



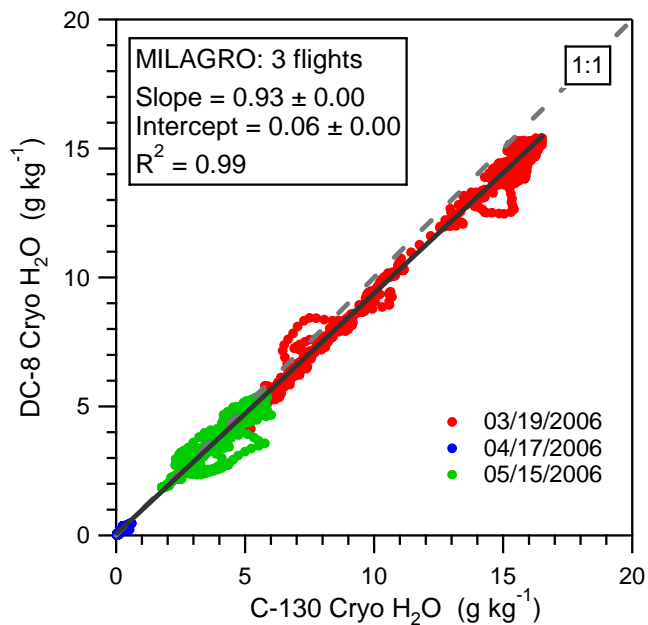
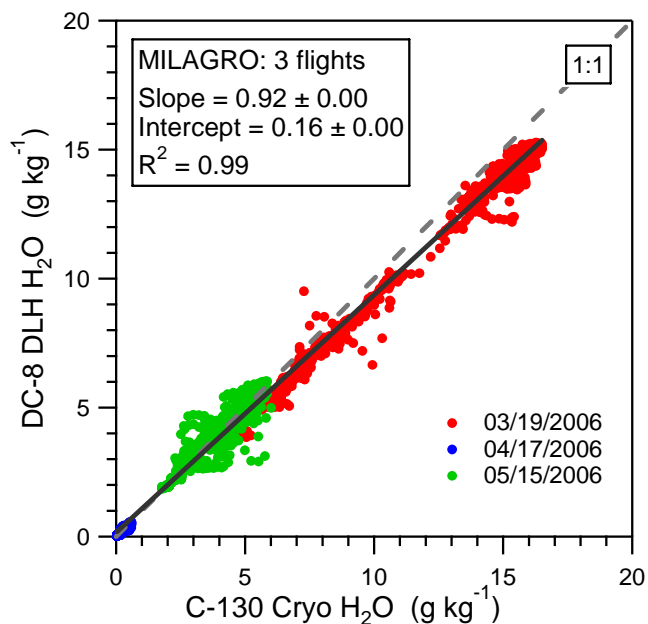
CO Comparison

NSF C-130 vs. NASA DC-8

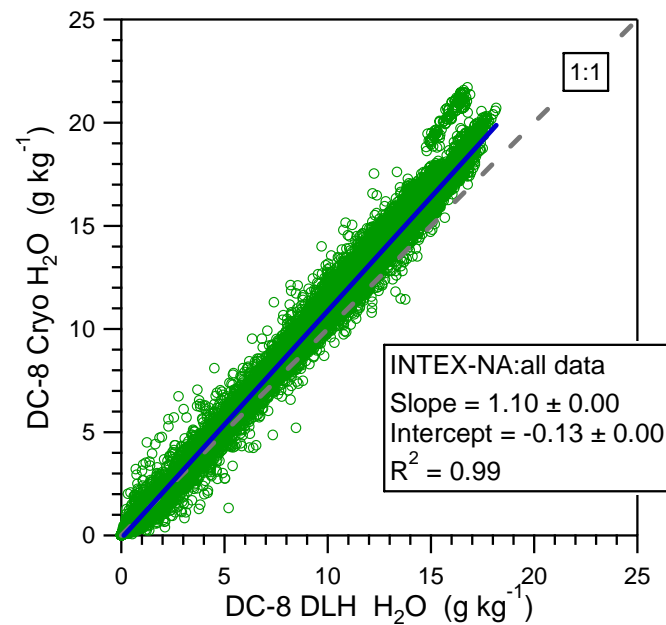
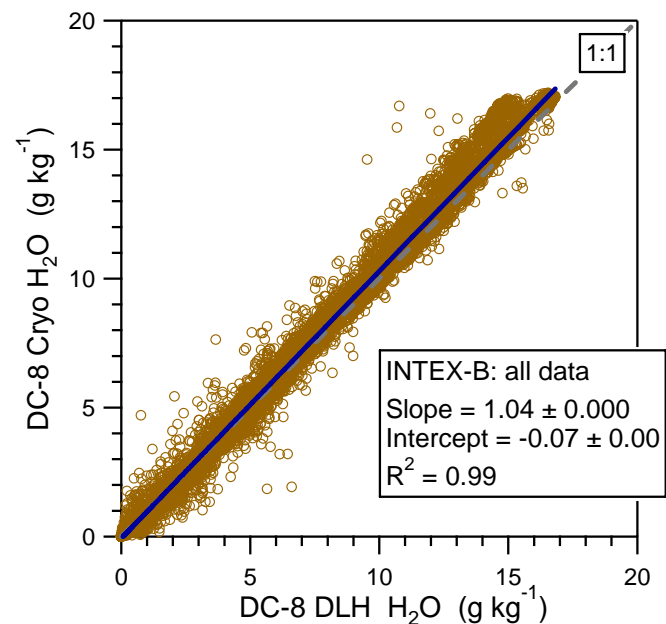


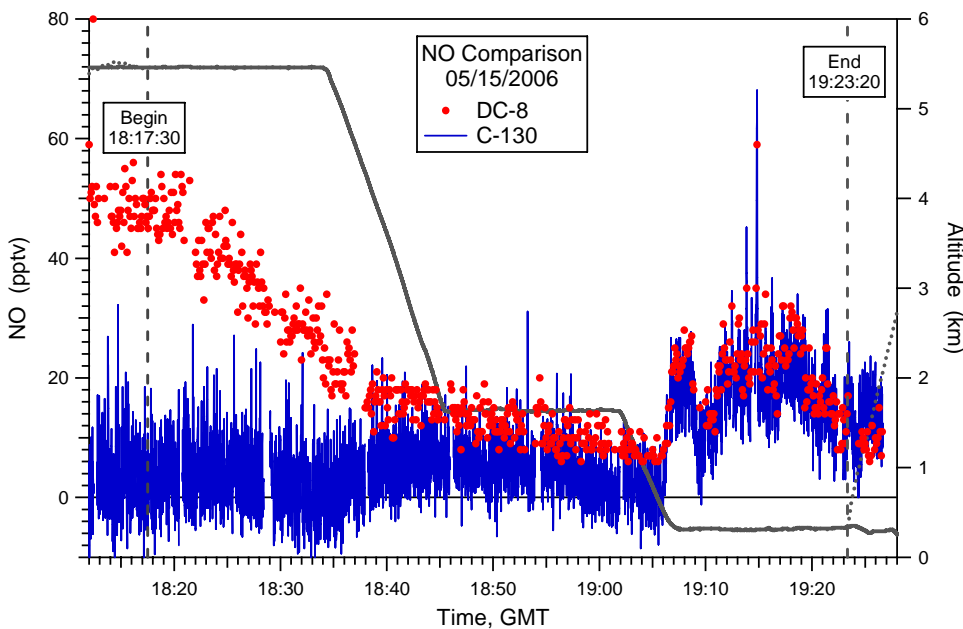
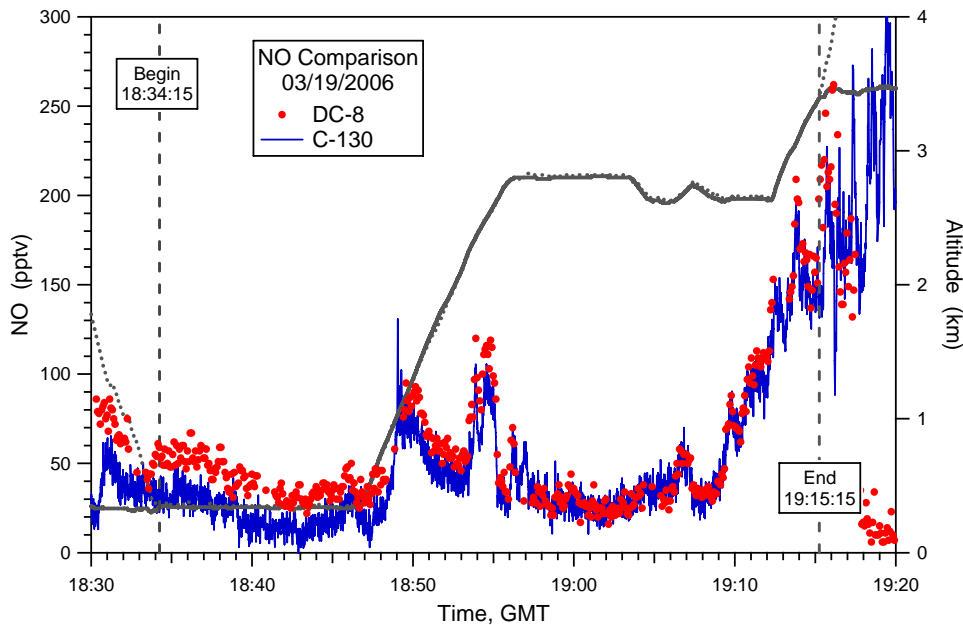
H₂O Comparison

MILAGRO NSF C-130 vs. NASA DC-8



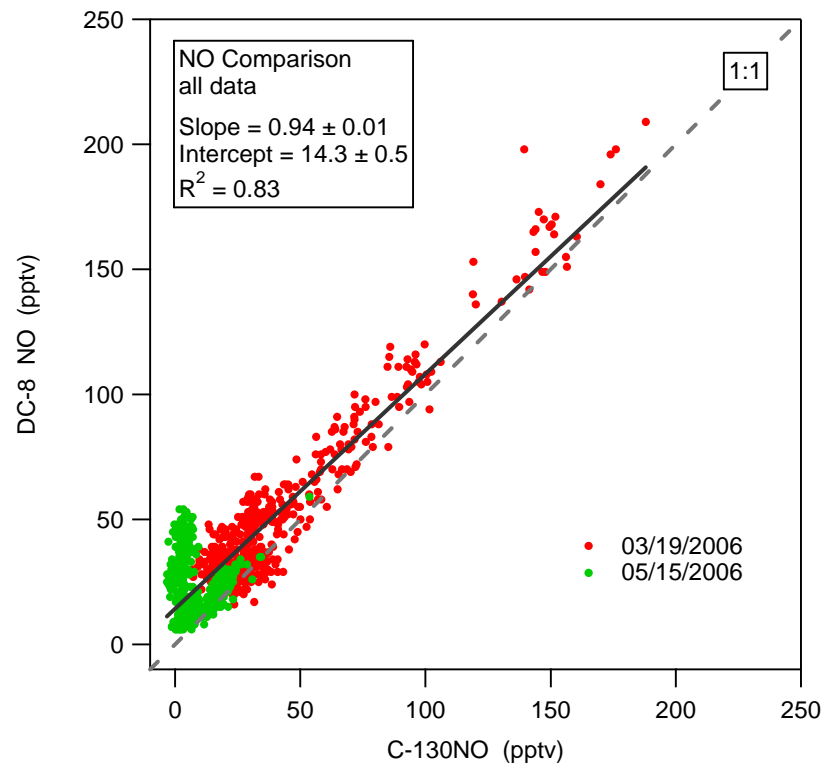
DC-8 Cryo vs. DLH





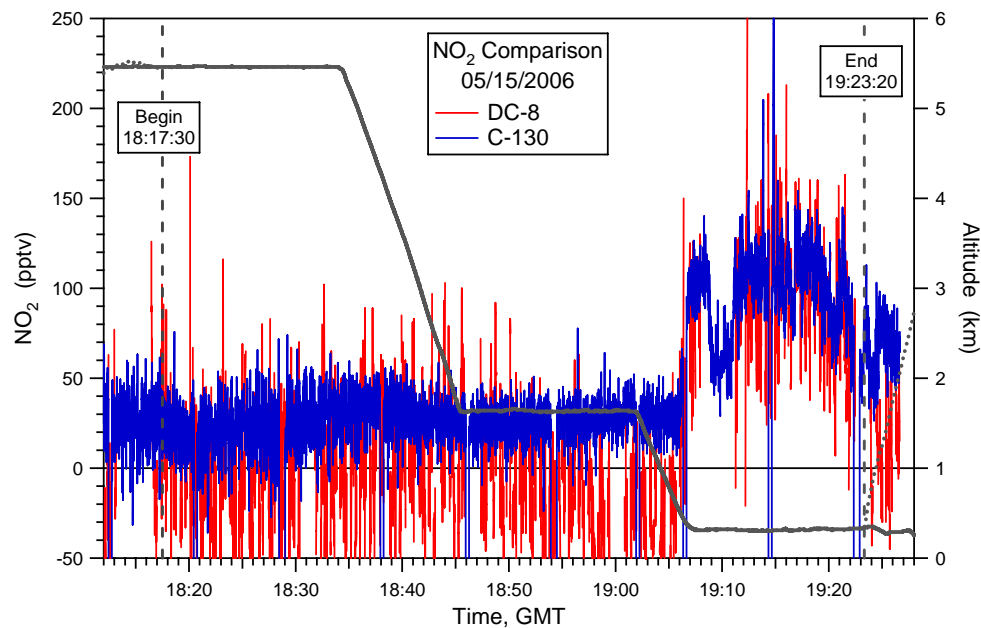
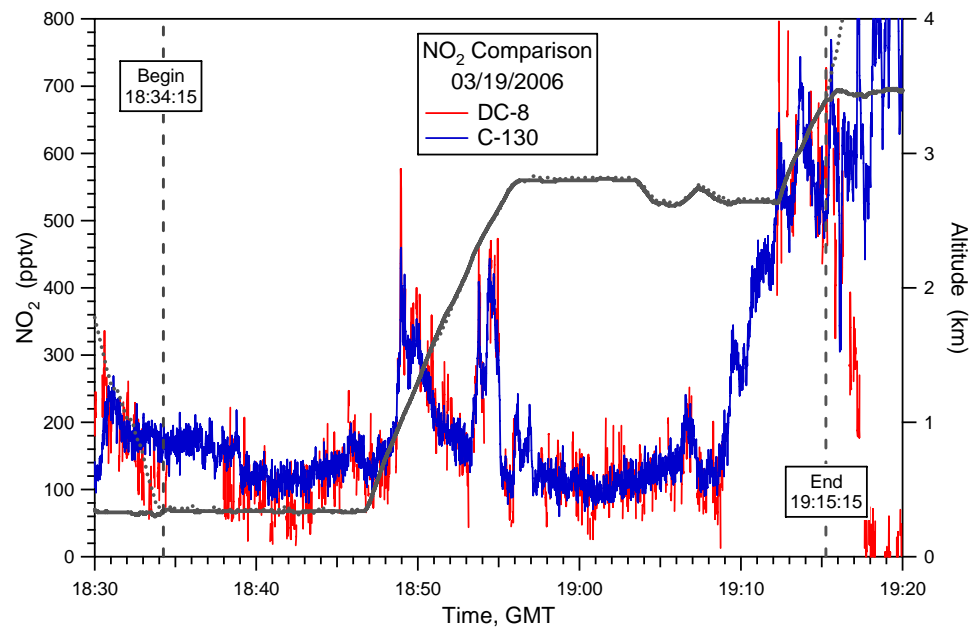
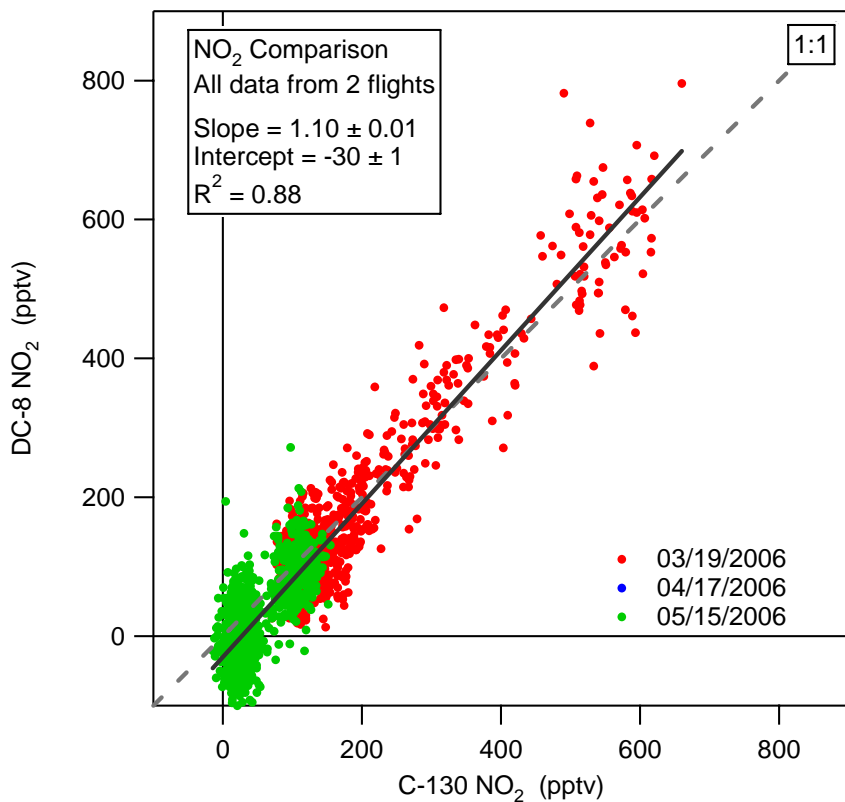
NO Comparison

NSF C-130 vs. NASA DC-8



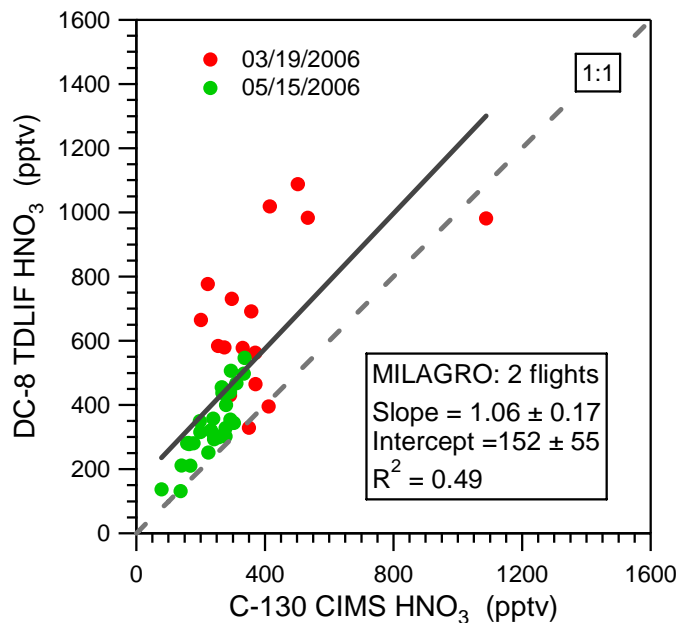
NO₂ Comparison

NSF C-130 vs. NASA DC-8

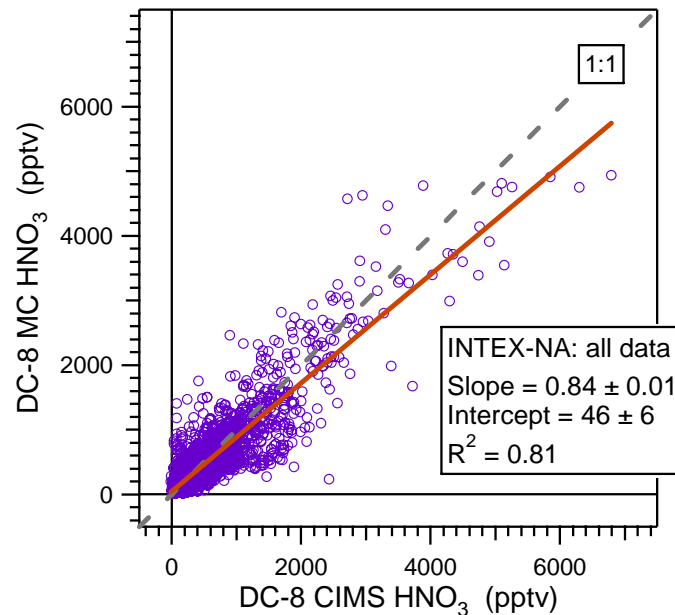
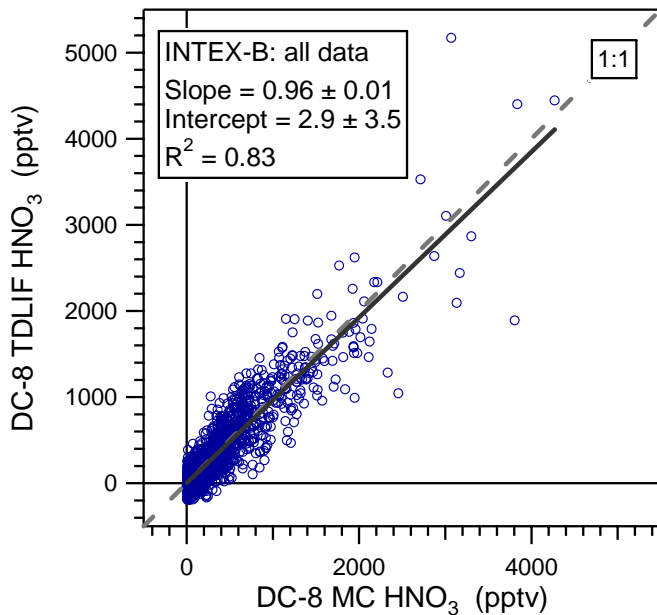
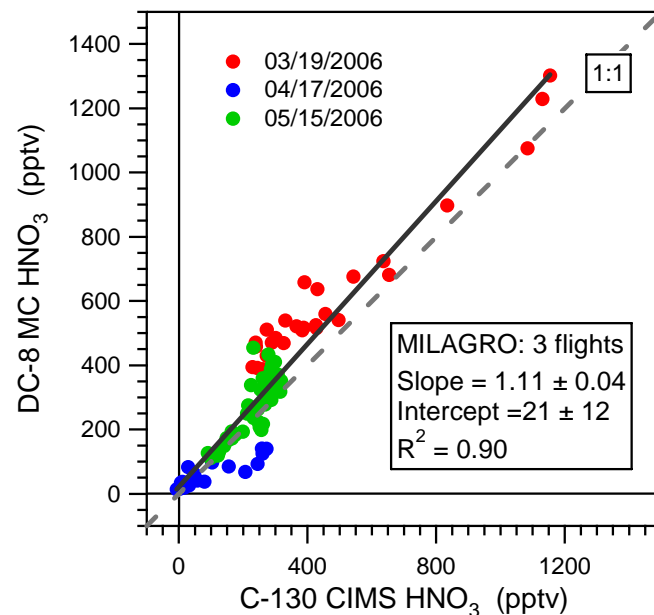


HNO₃ Comparison

TDLIF vs. Mist Chamber and TDLIF vs. CIMS

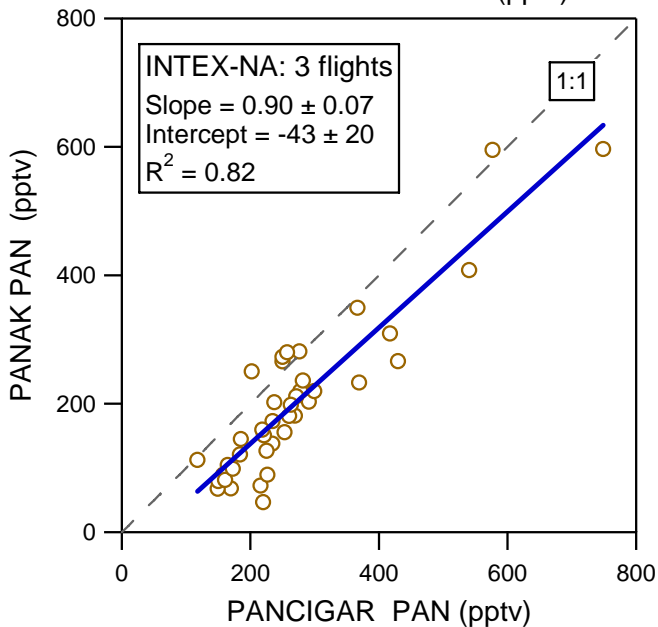
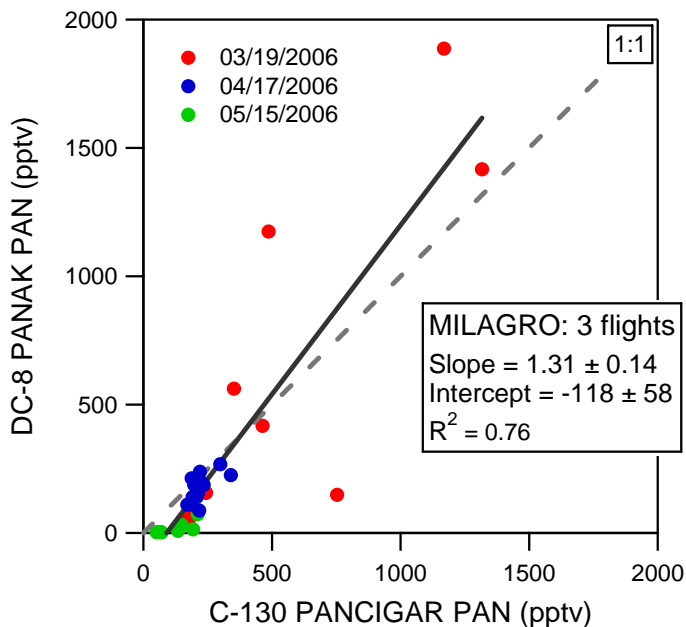


Mist Chamber vs. CIMS

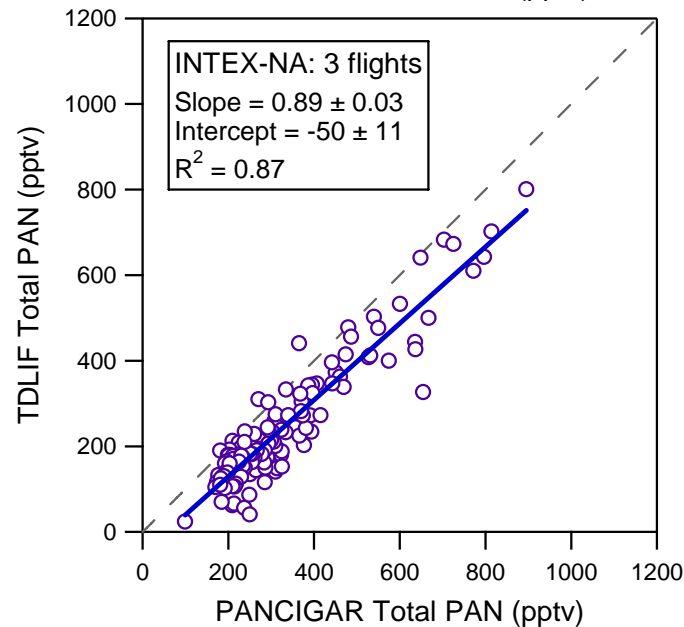
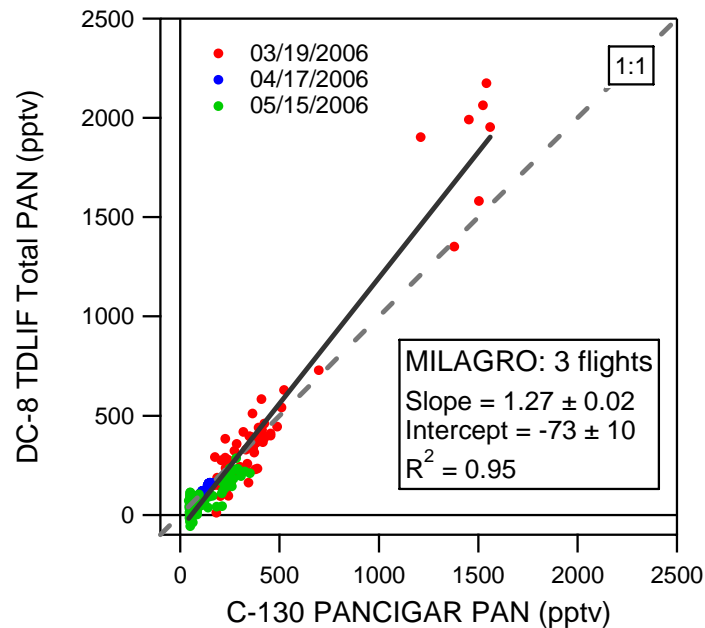


PAN Comparison

PAN Comparison: PANAK vs. PANCIGAR

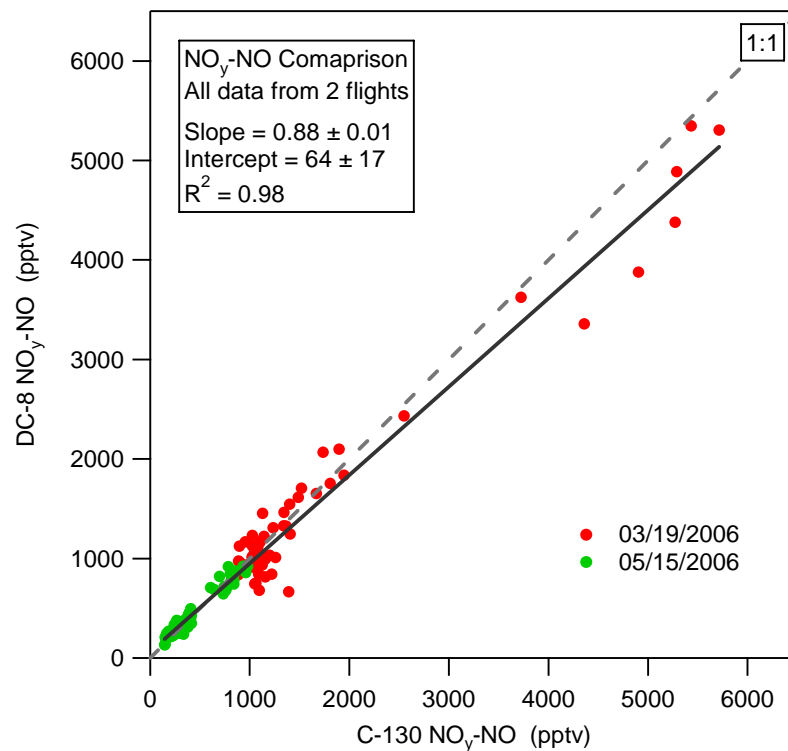
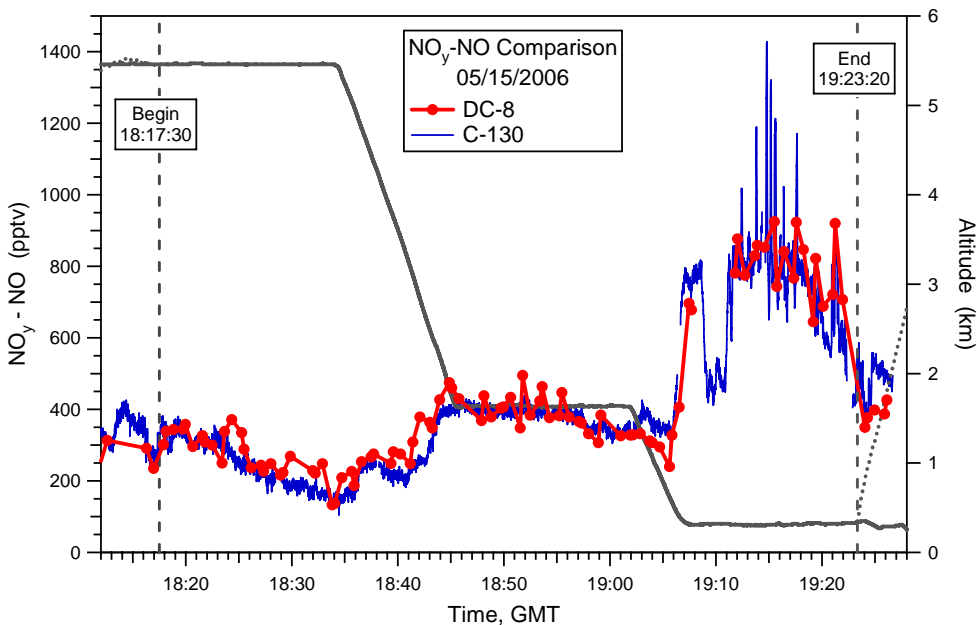
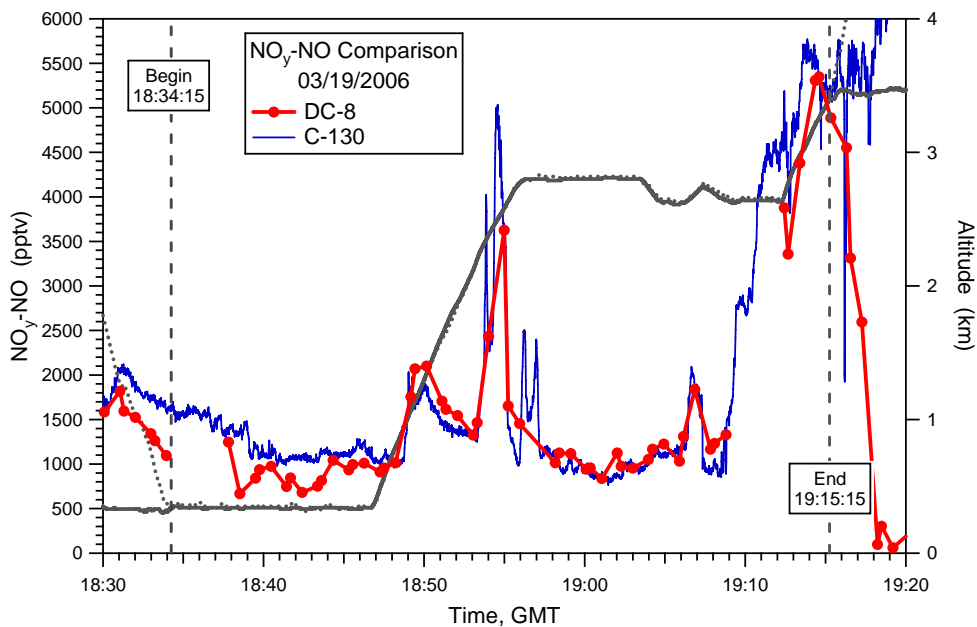


Total PAN Comparison: TDLIF vs. PANCIGAR



NO_y - NO Comparison

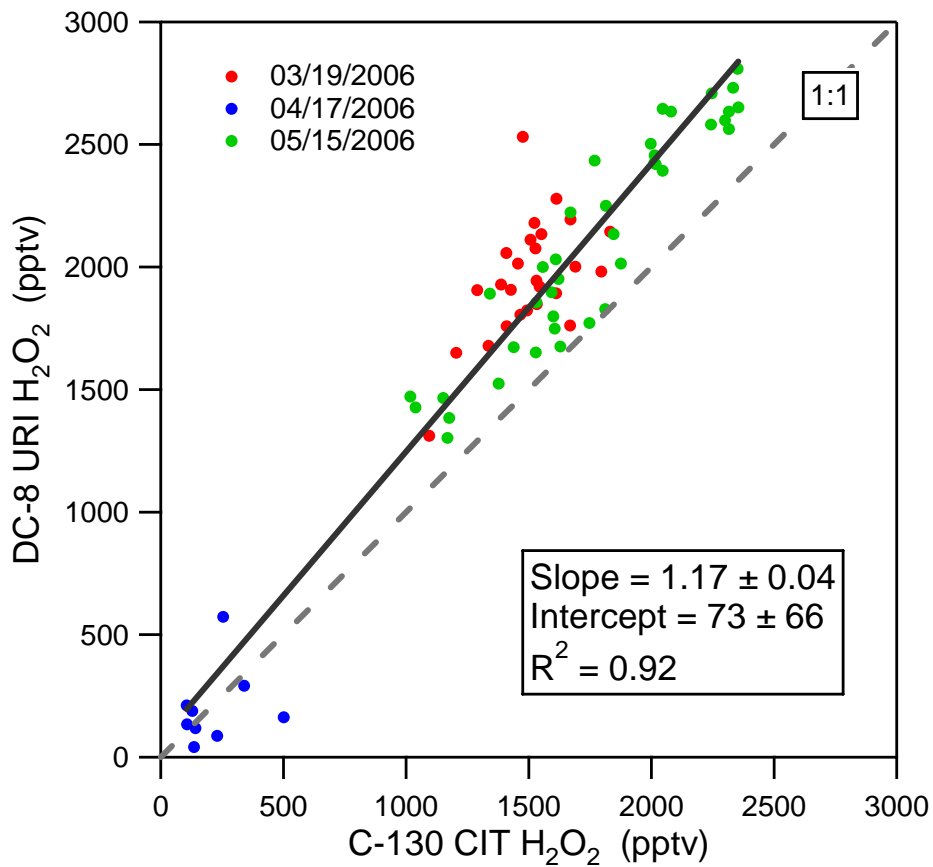
NSF C-130 vs. NASA DC-8



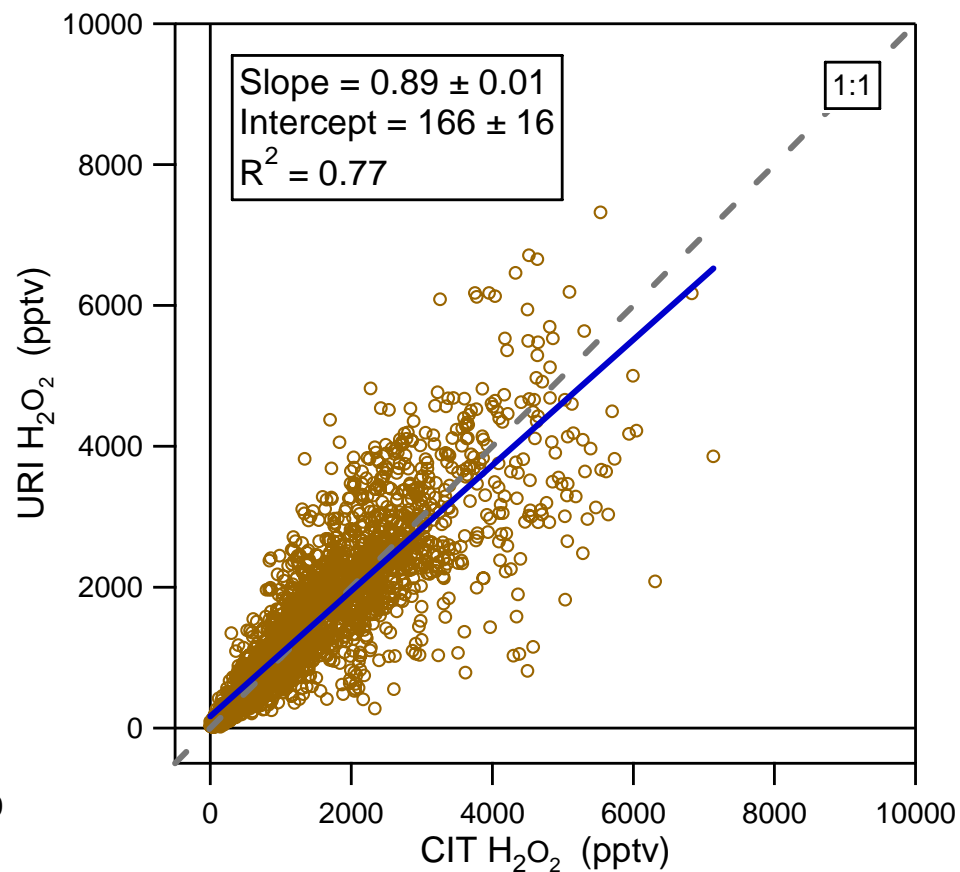
H₂O₂ Comparison

NSF C-130 vs. NASA DC-8

MILAGRO: 3 Flights

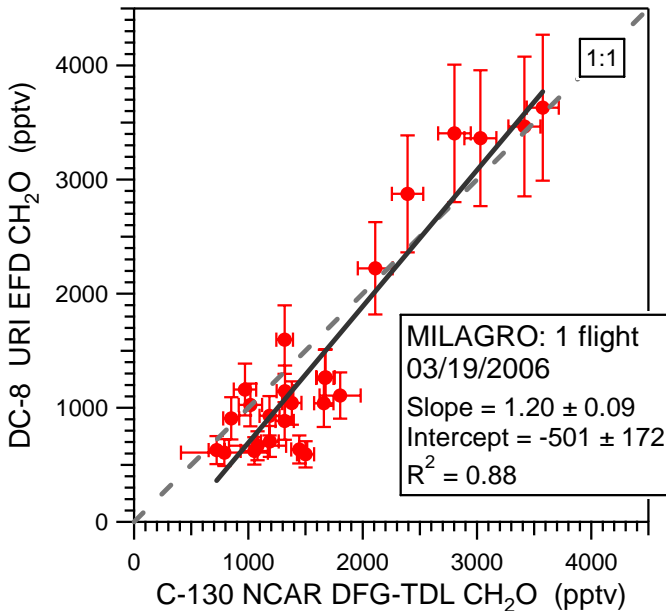
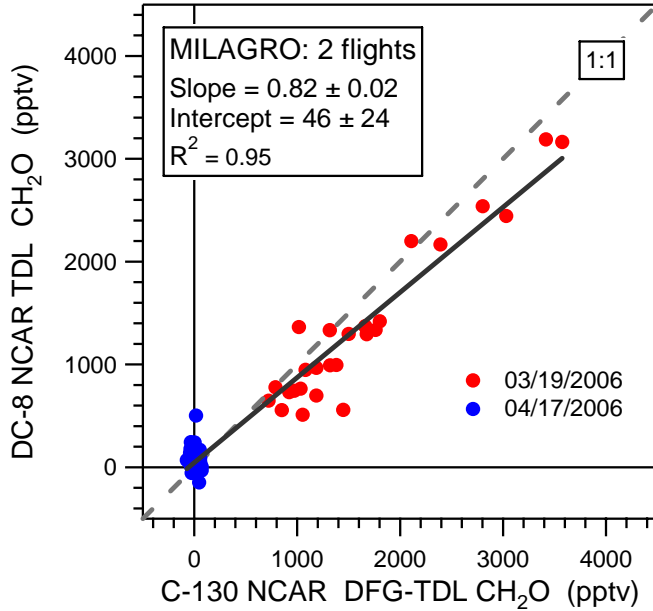


INTEX-NA all data

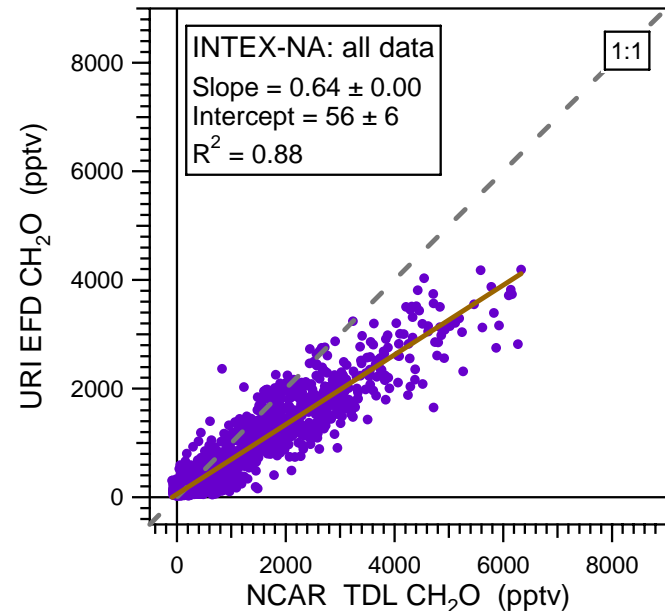
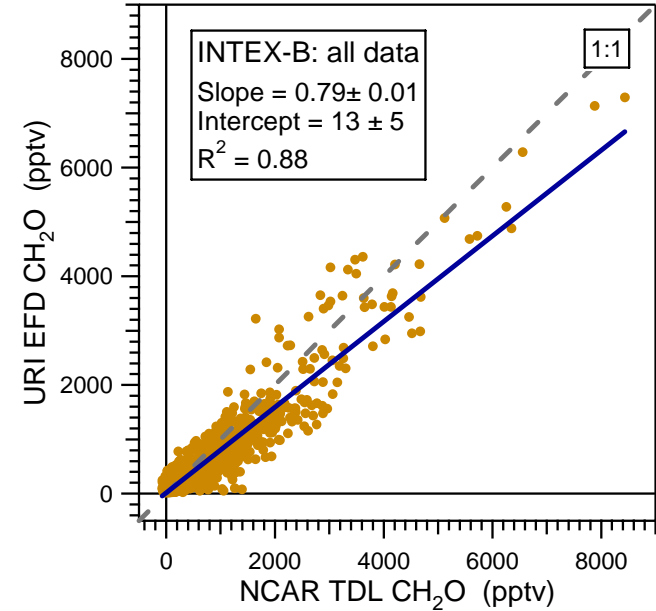


CH₂O Comparison

NSF C-130 vs. NASA DC-8

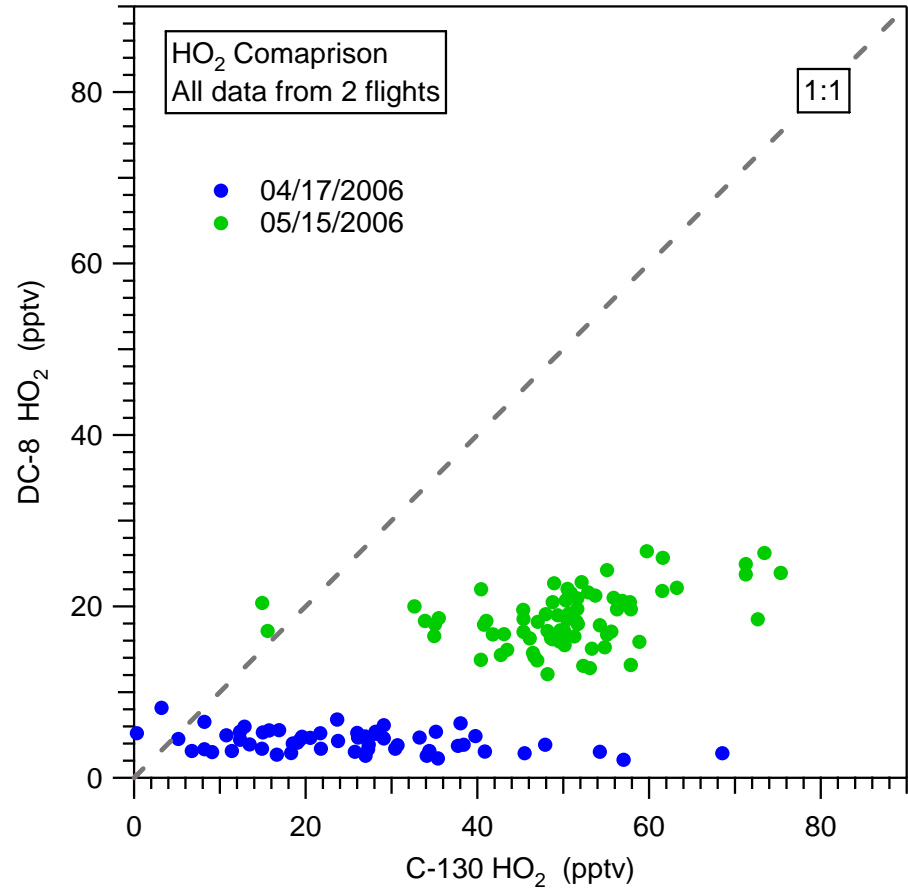
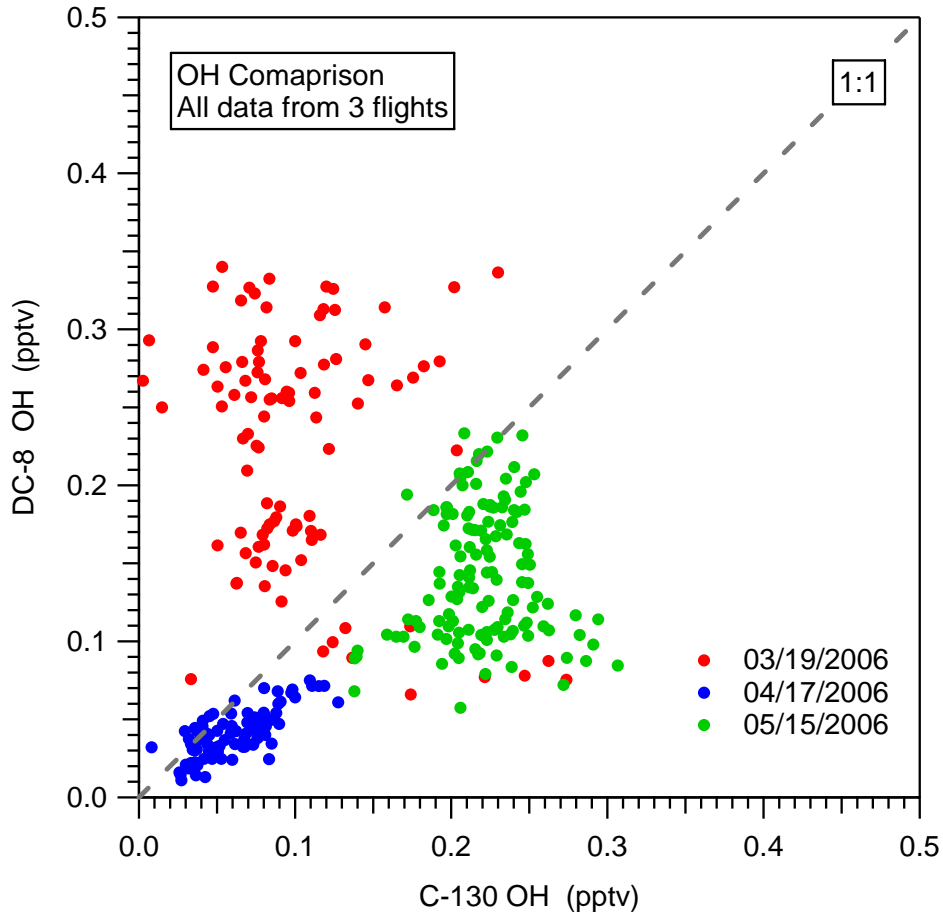


URI EFD vs. NCAR TDL

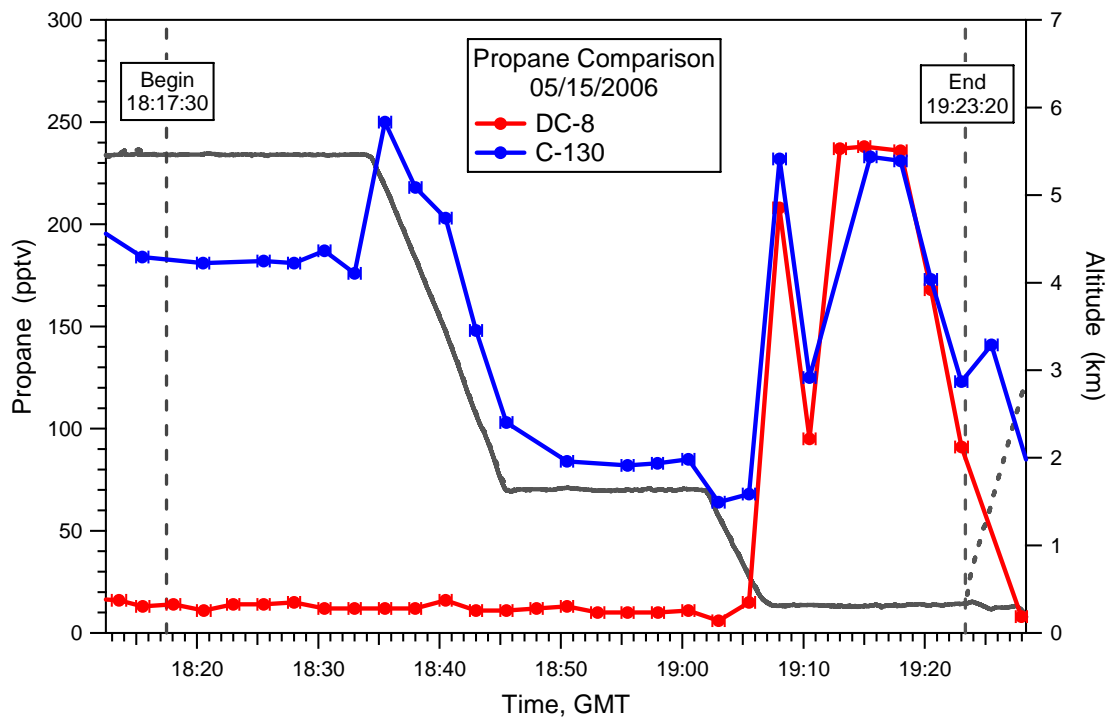
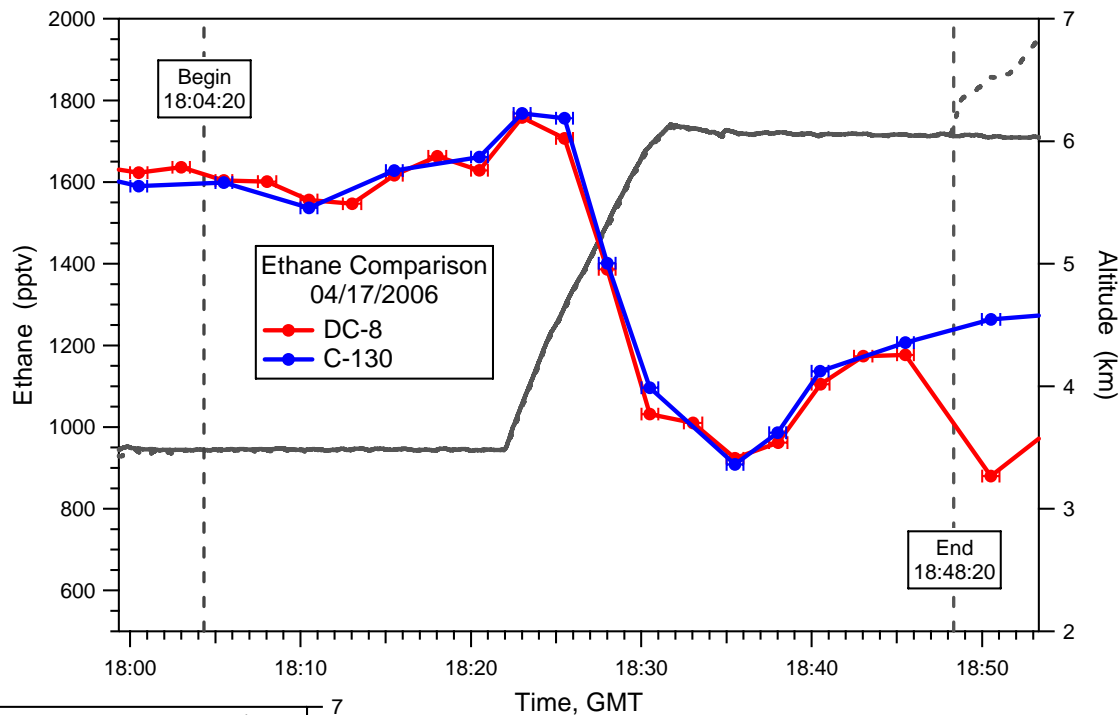


OH and HO₂ Comparison

NSF C-130 vs. NASA DC-8

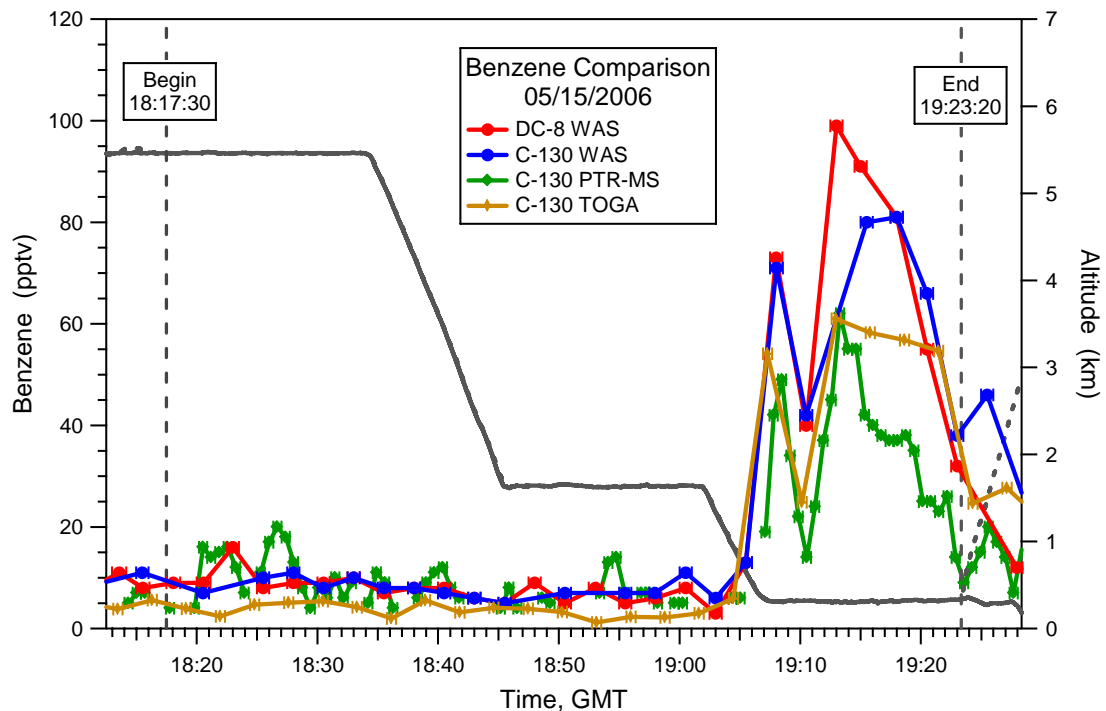
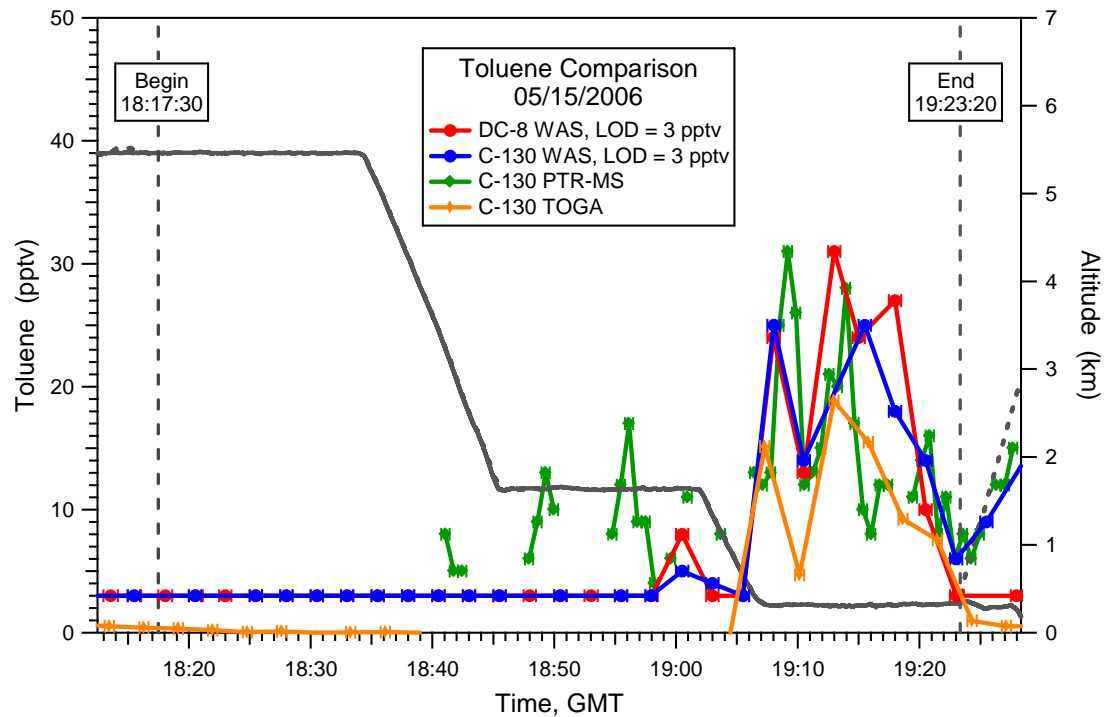


Ethane and Propane Comparison

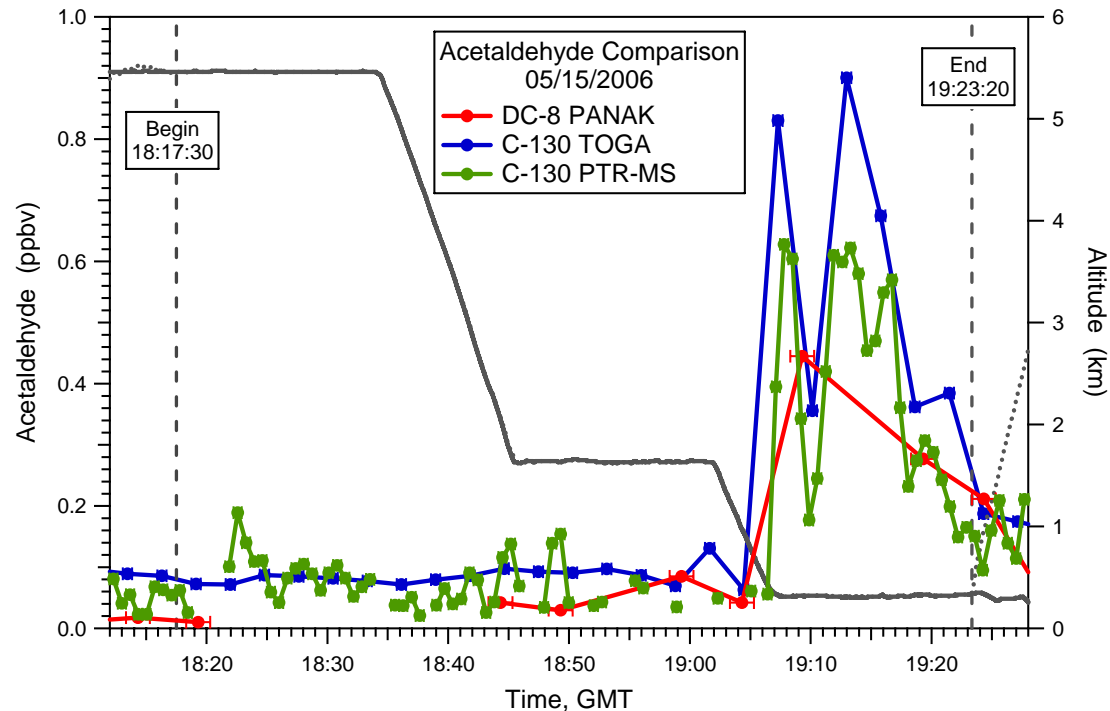
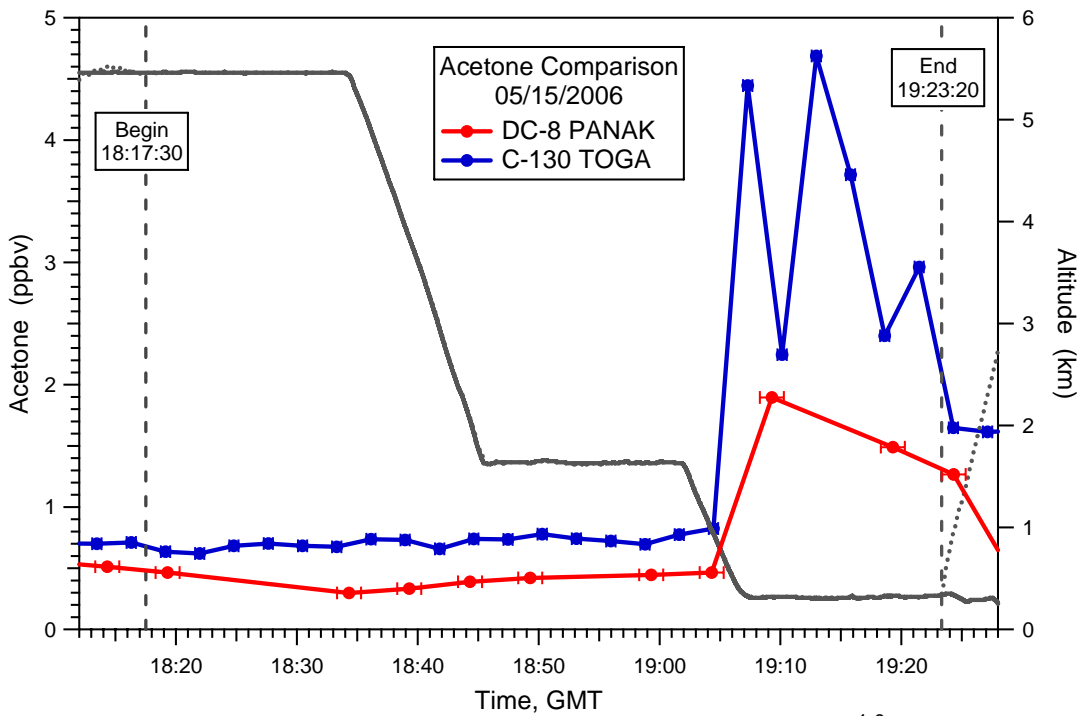


Note: There was a propane cylinder in the UCI rack which contributed to some contaminations no more than a few hundred pptv.

Benzene and Toluene Comparison

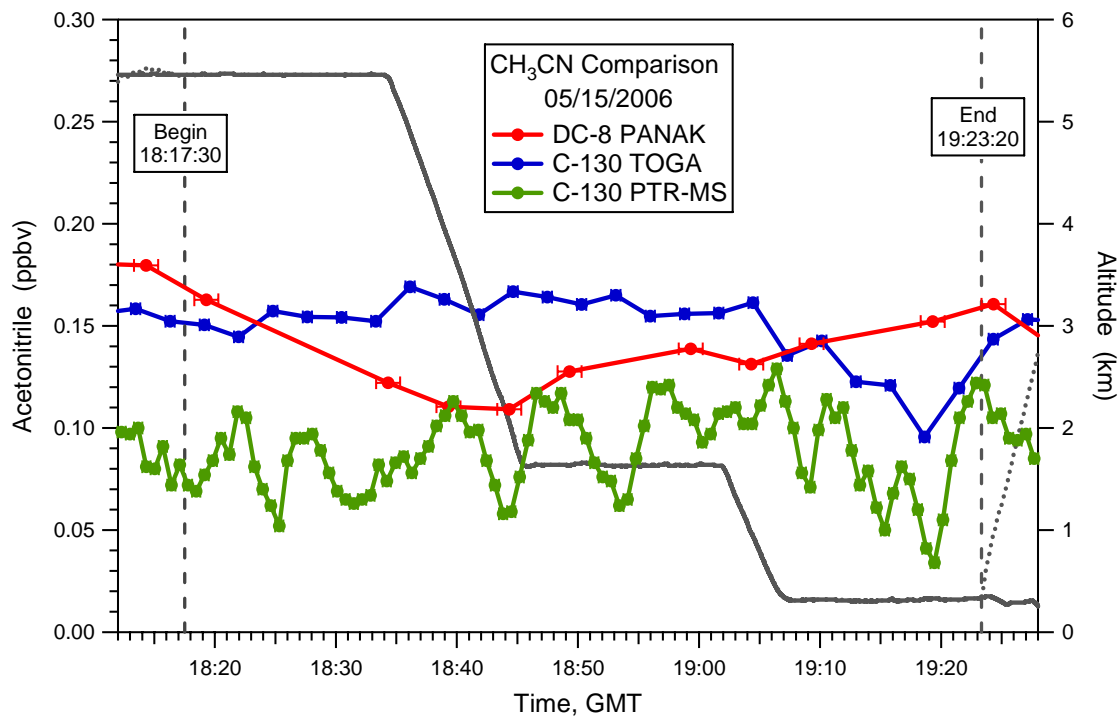
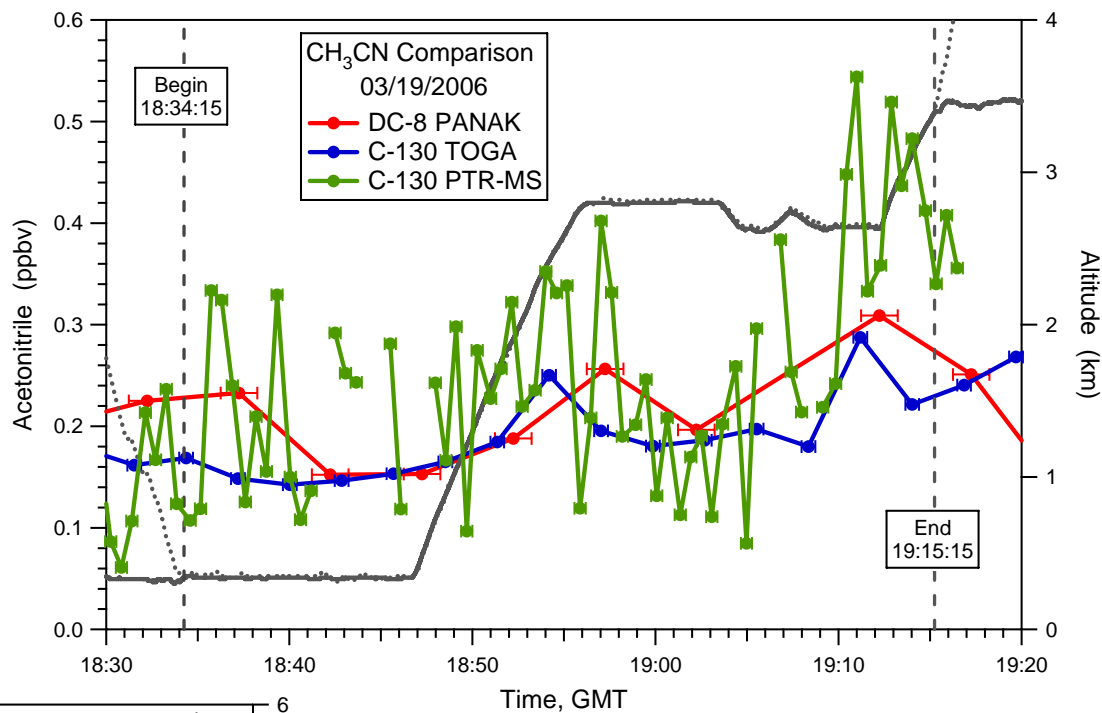


Acetone and Acetaldehyde Comparison NSF C-130 vs. NASA DC-8



CH₃CN Comparison

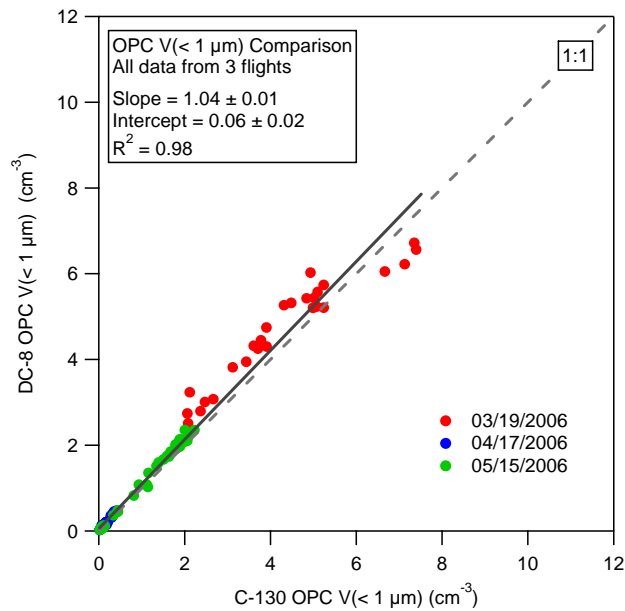
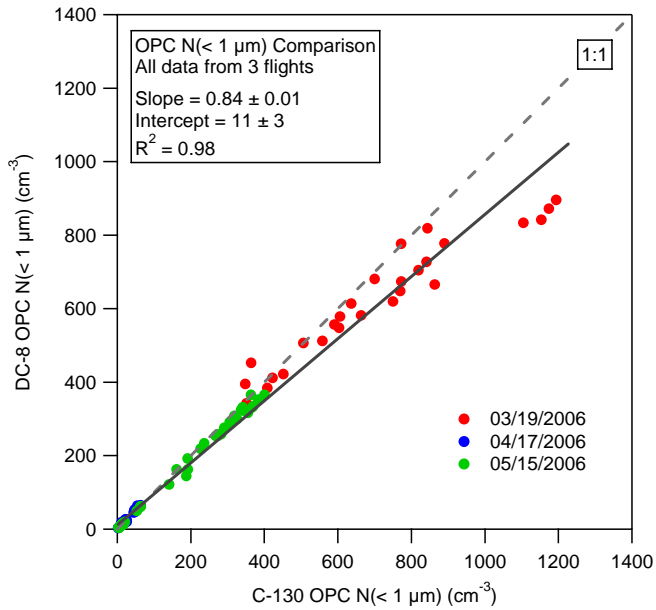
NSF C-130 vs. NASA DC-8



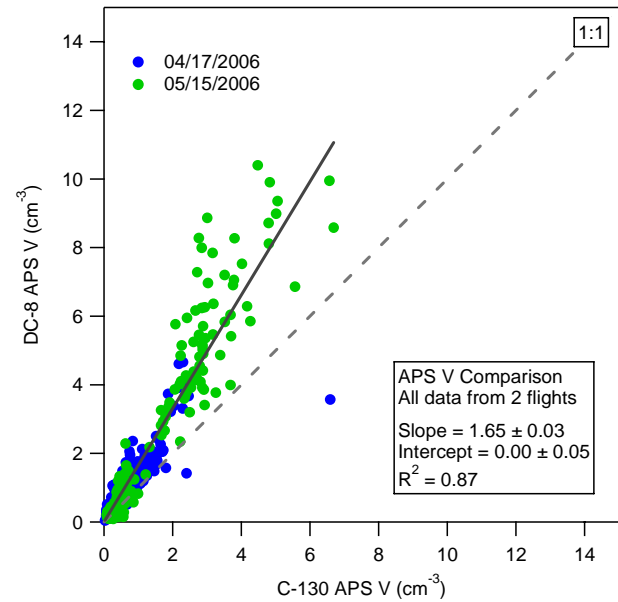
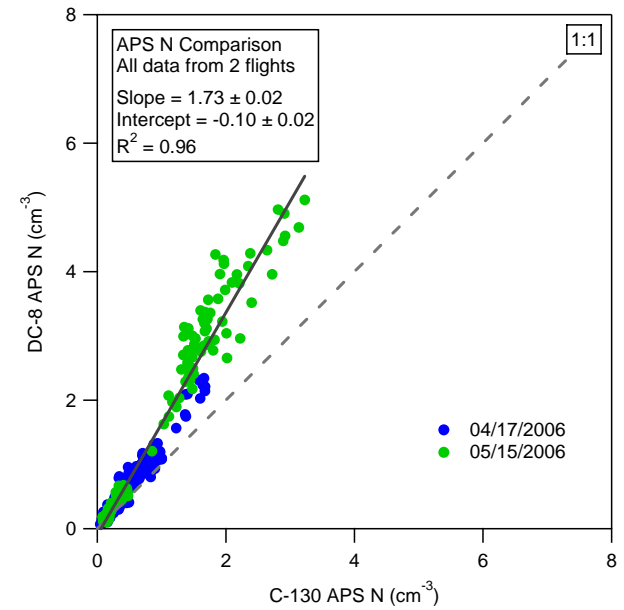
Particle Loading Comparison

NSF C-130 vs. NASA DC-8

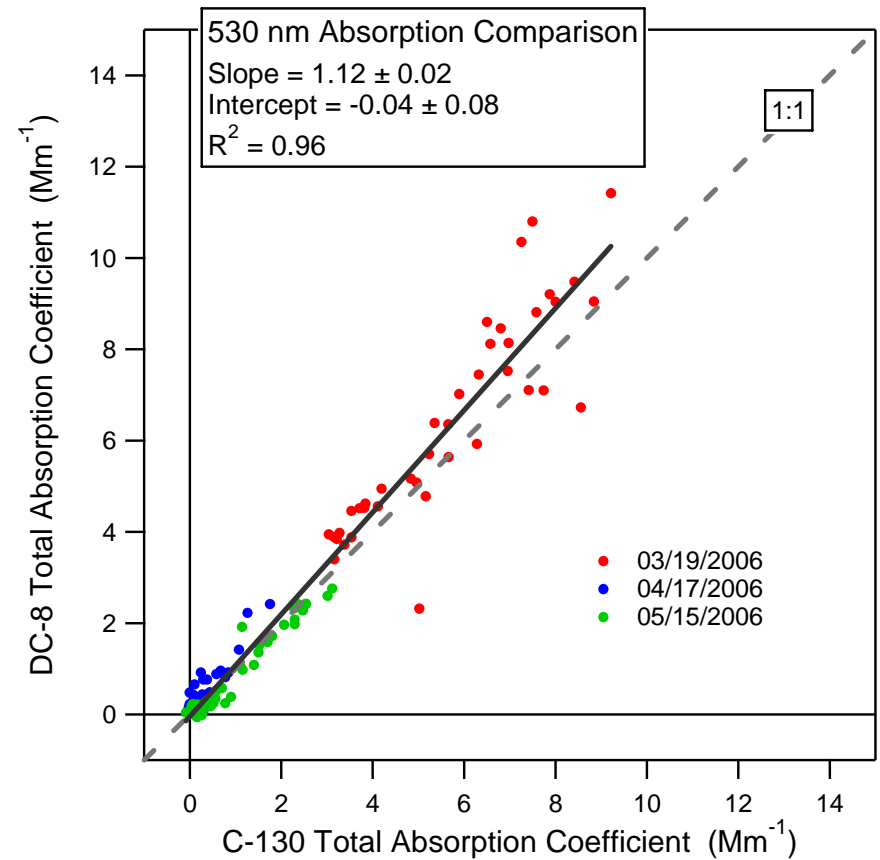
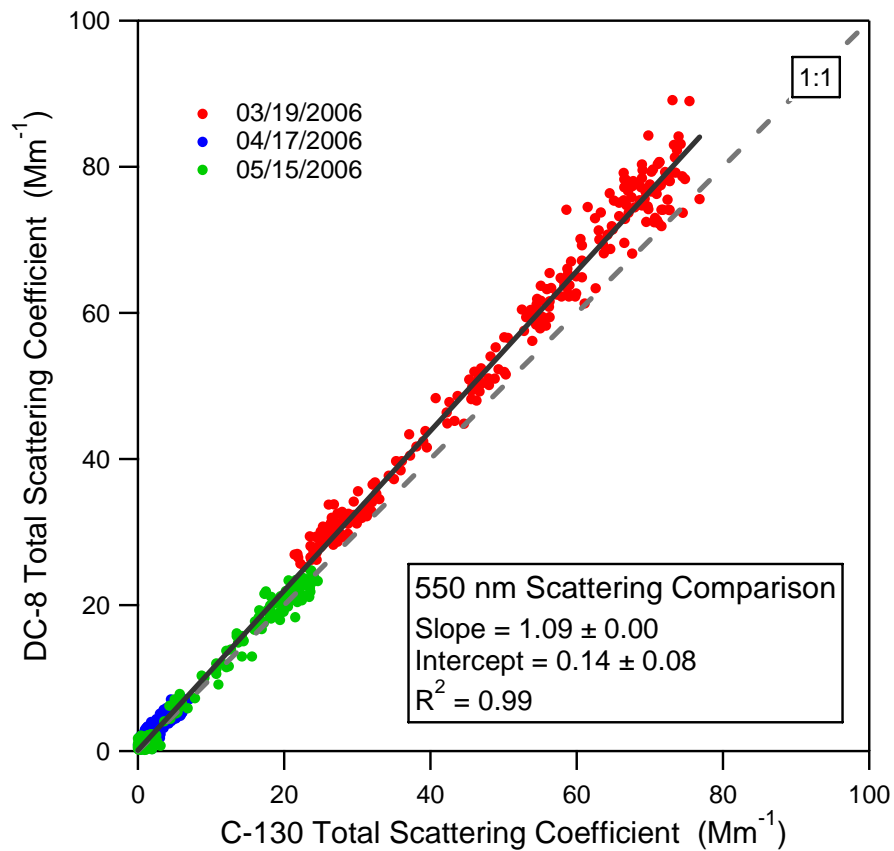
Submicron OPC Size Range (0.15 – 1 μm)



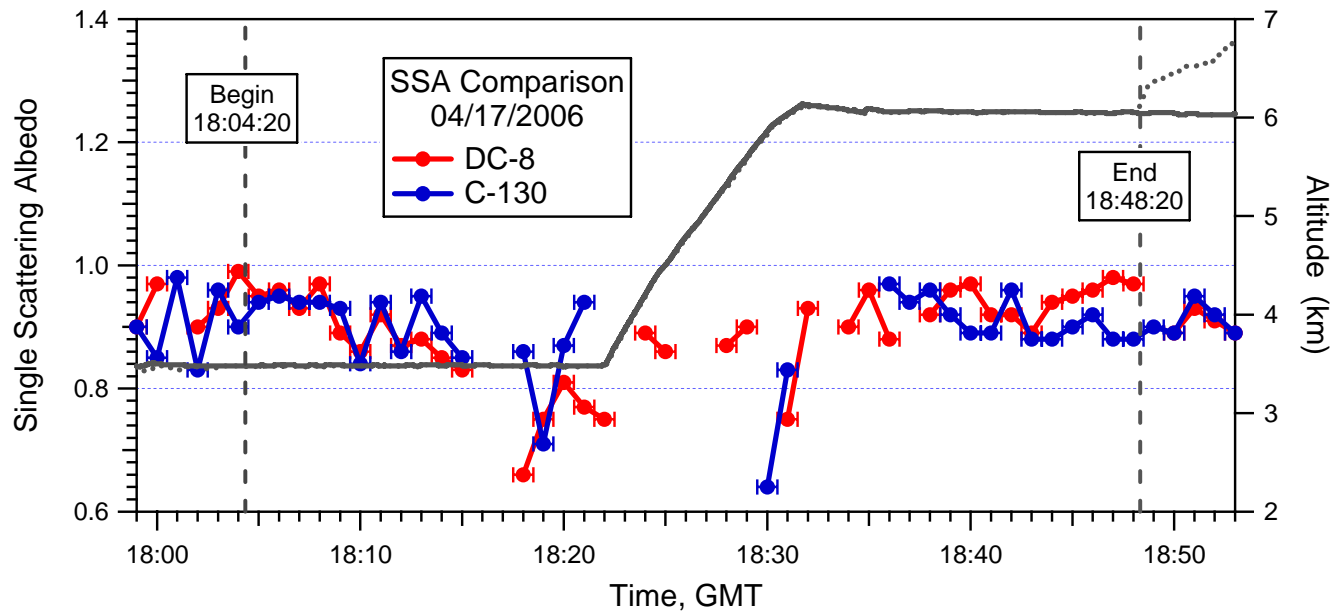
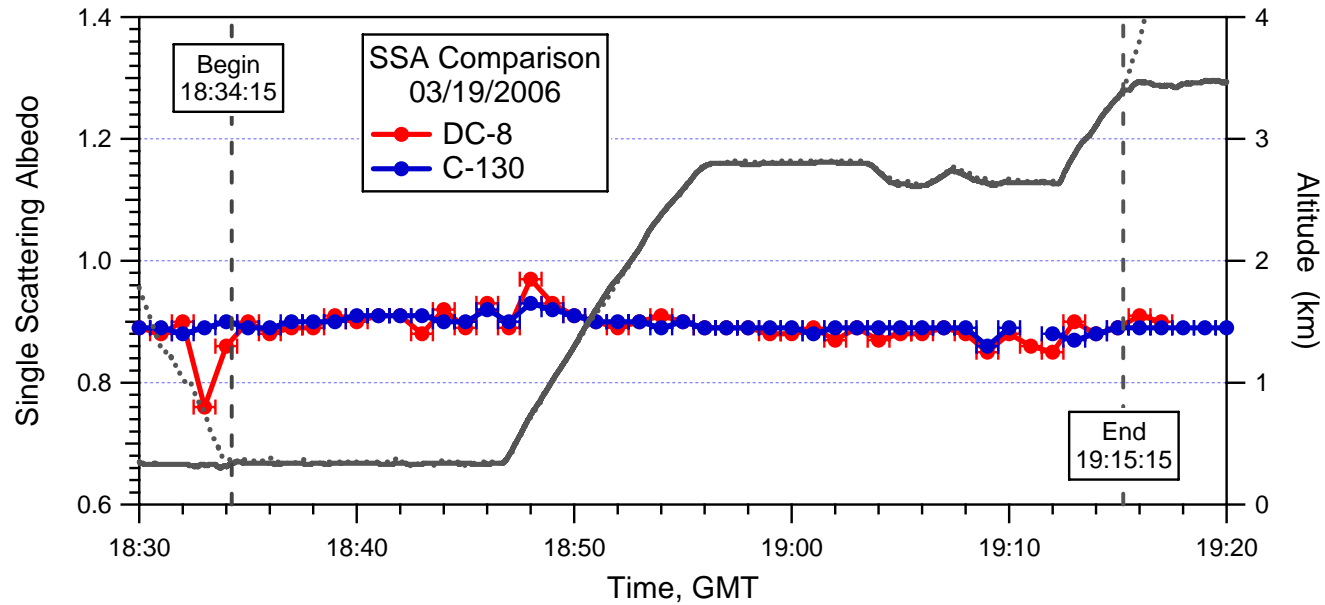
APS Size Range (0.7 – 20 μm)



Scattering and Absorption Coefficient Comparison

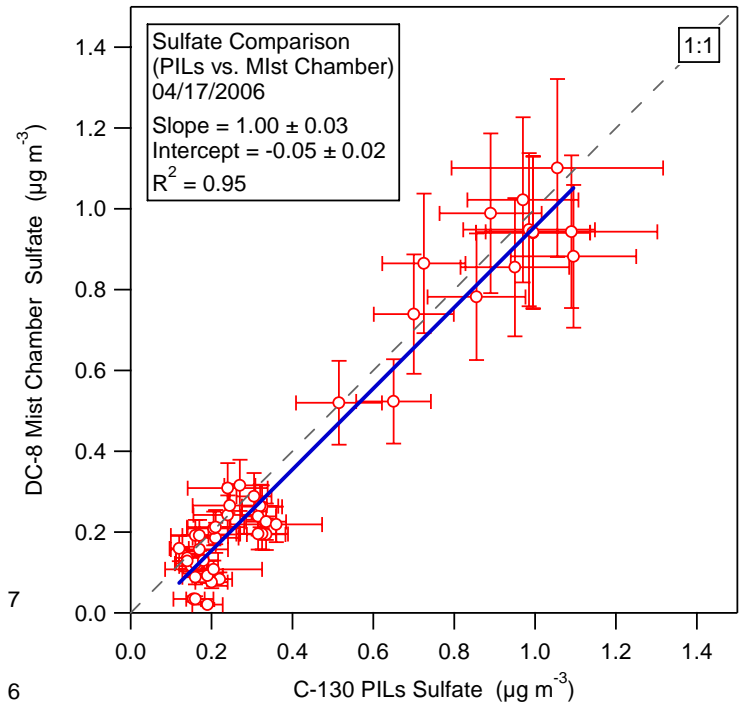
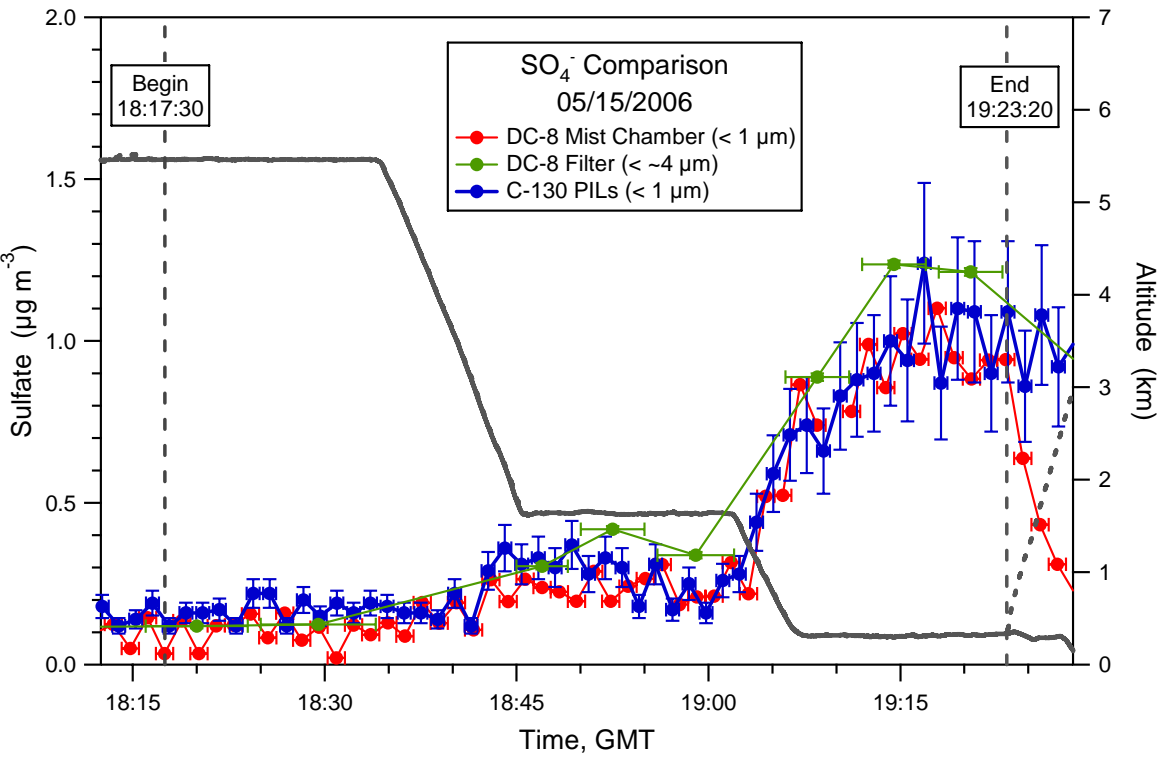


SSA Comparison



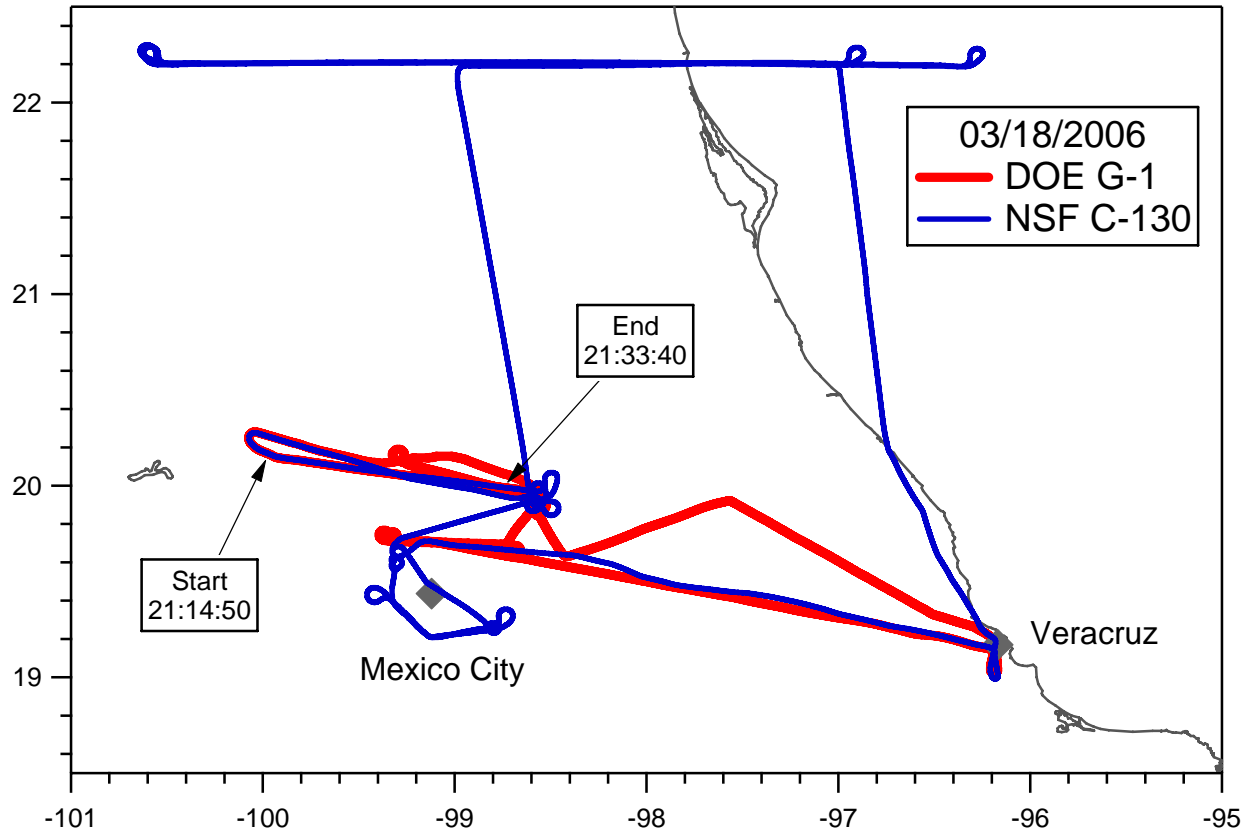
Particle Submicron Sulfate Comparison

NSF C-130 vs. NASA DC-8

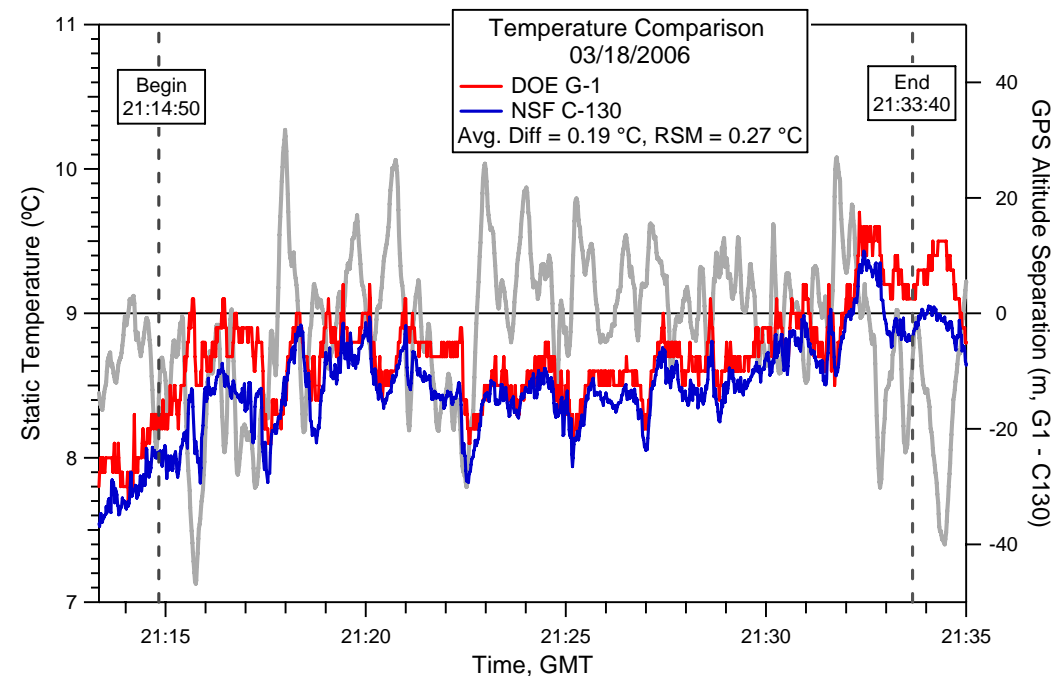
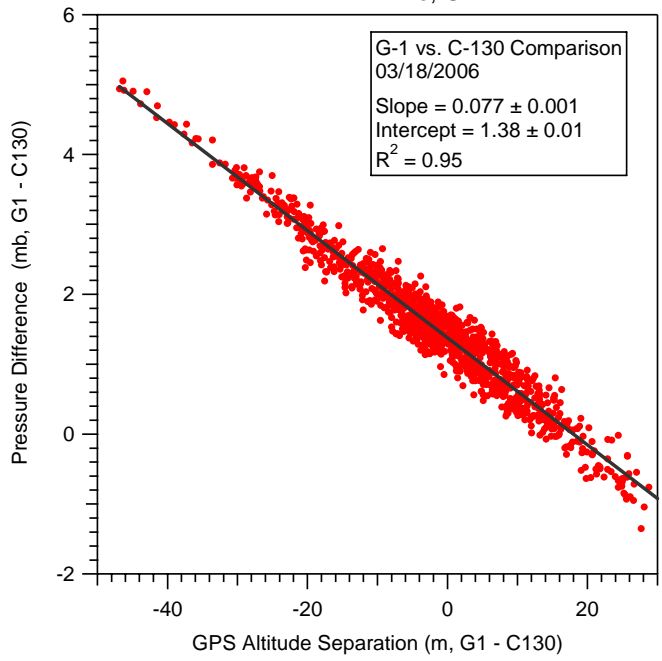
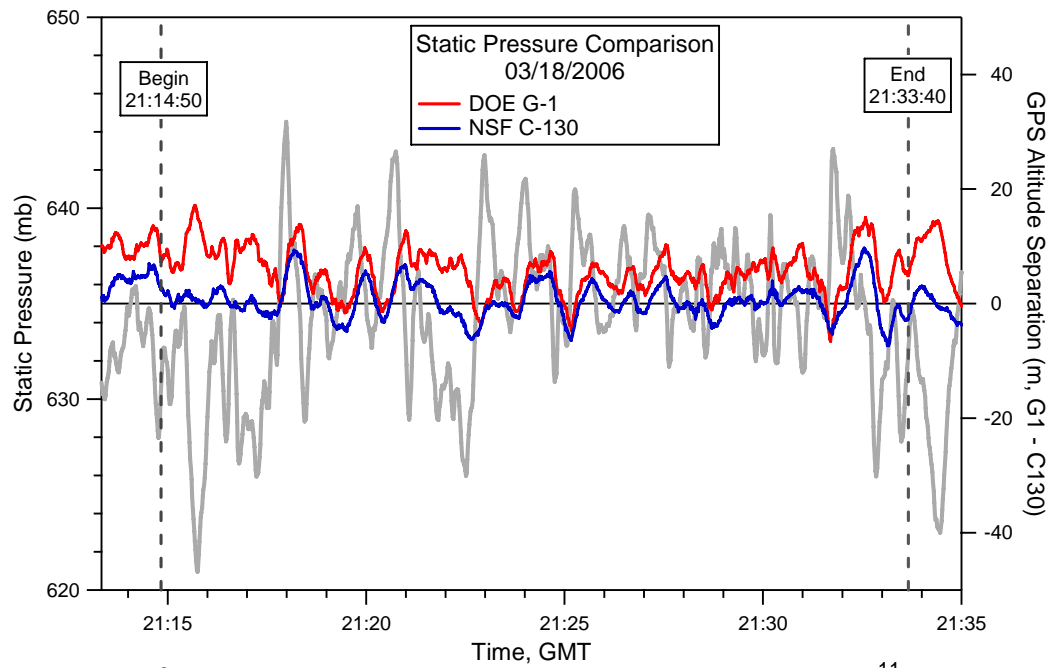


G-1 vs. C-130 Comparison

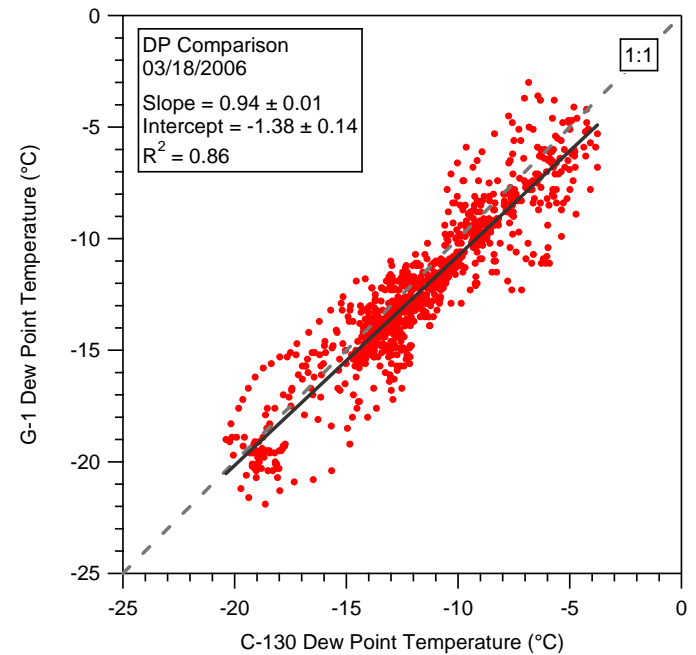
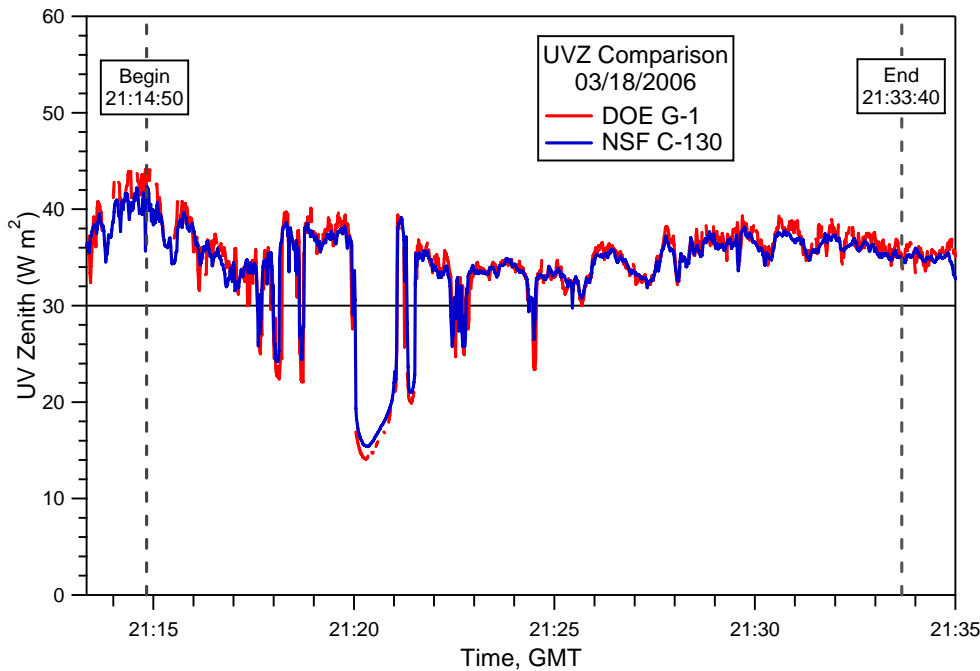
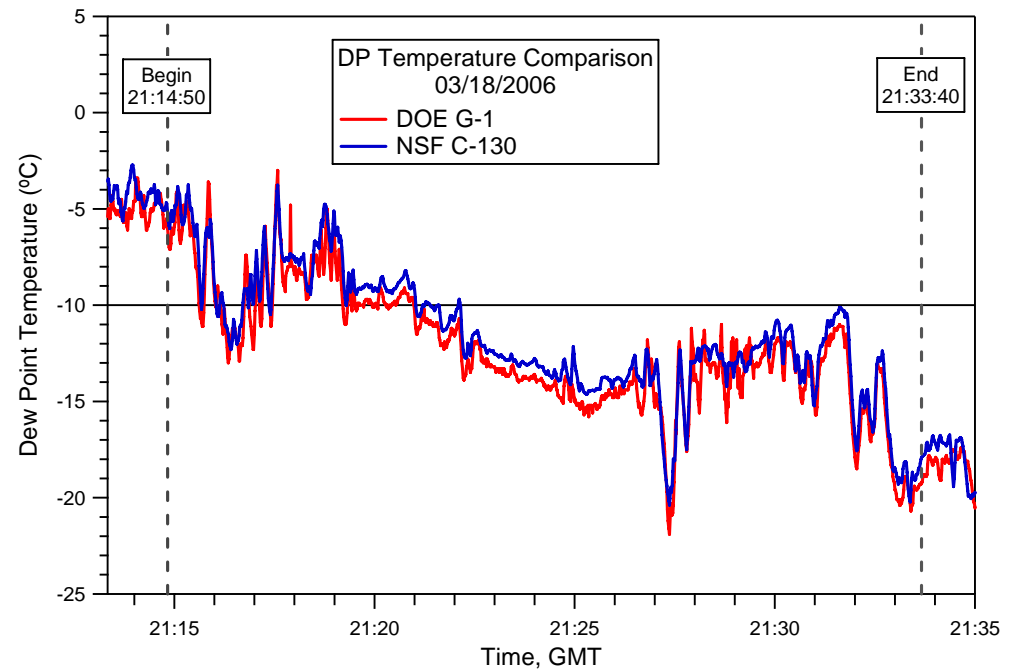
Flight Tracks

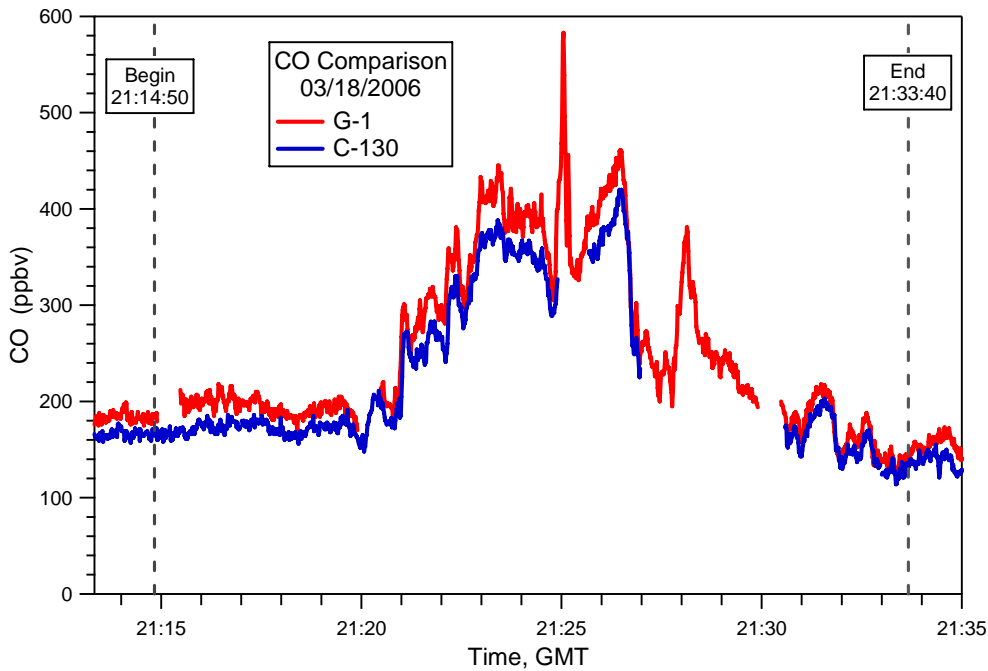


Pressure and Temperature Comparison DOE G-1 vs. NSF C-130



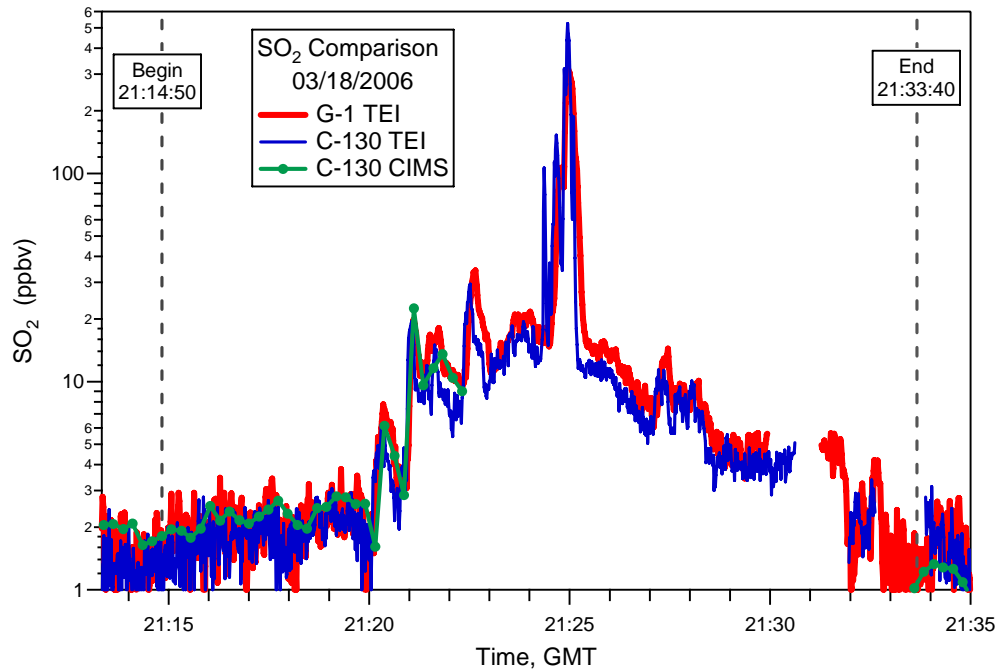
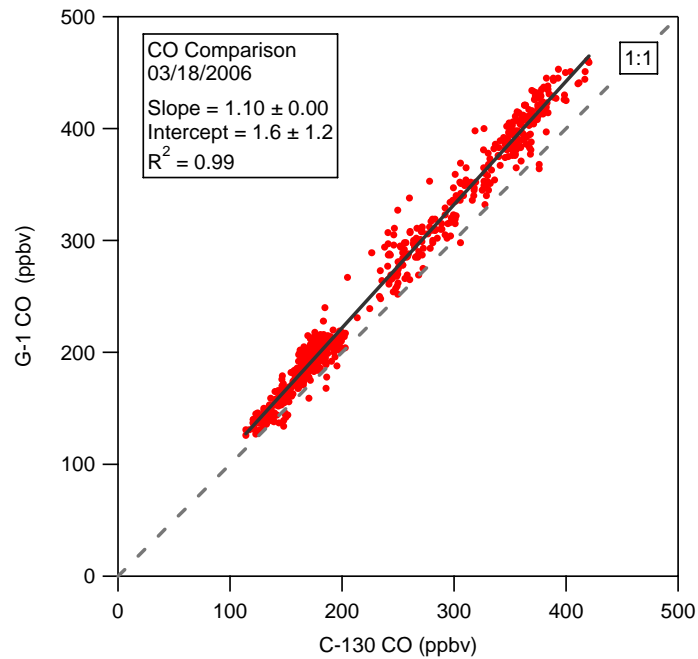
Dew Point and UVZ Comparison DOE G-1 vs. NSF C-130



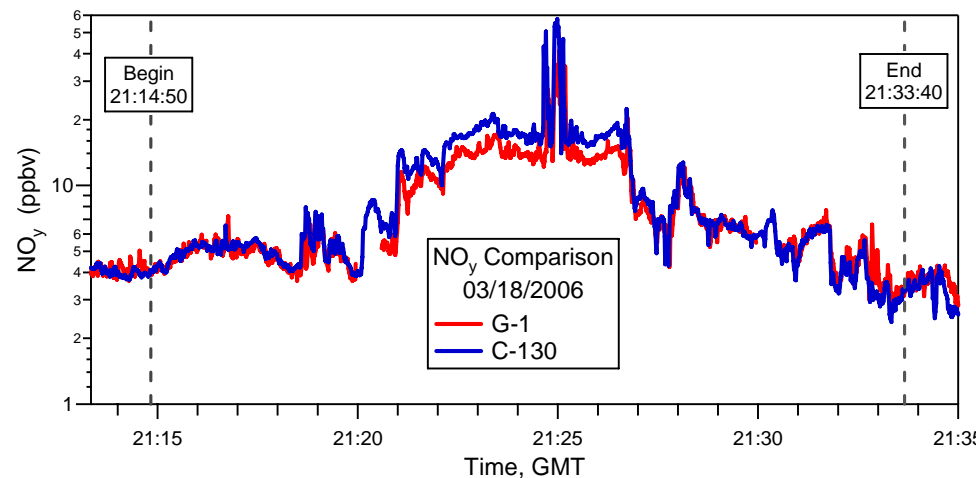
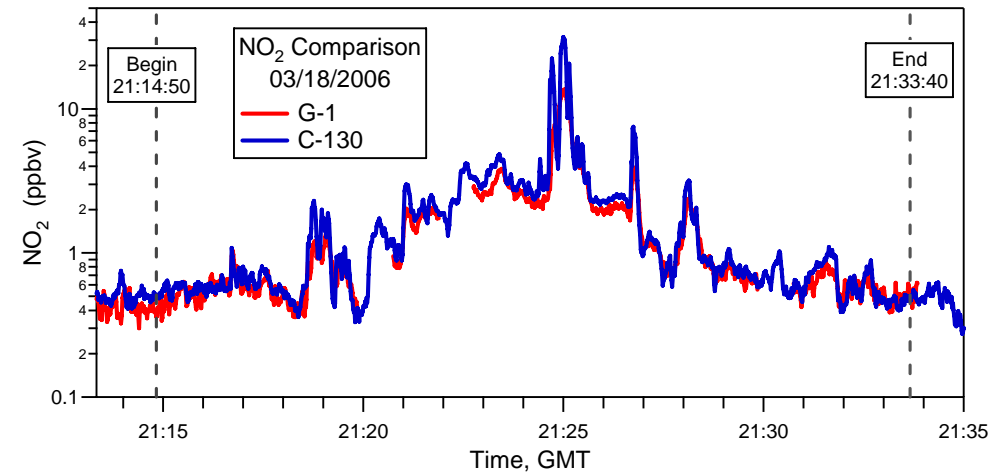
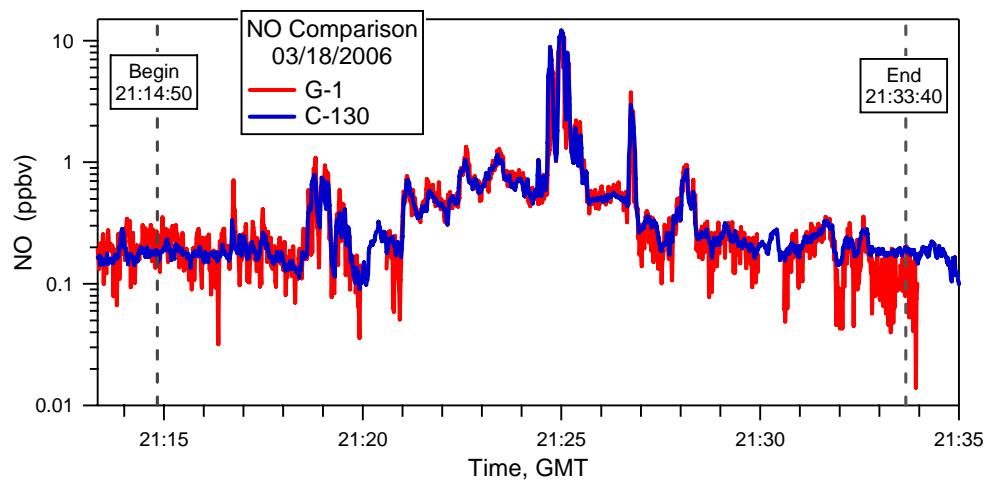


CO and SO₂ Comparison

DOE G-1 vs. NSF C-130

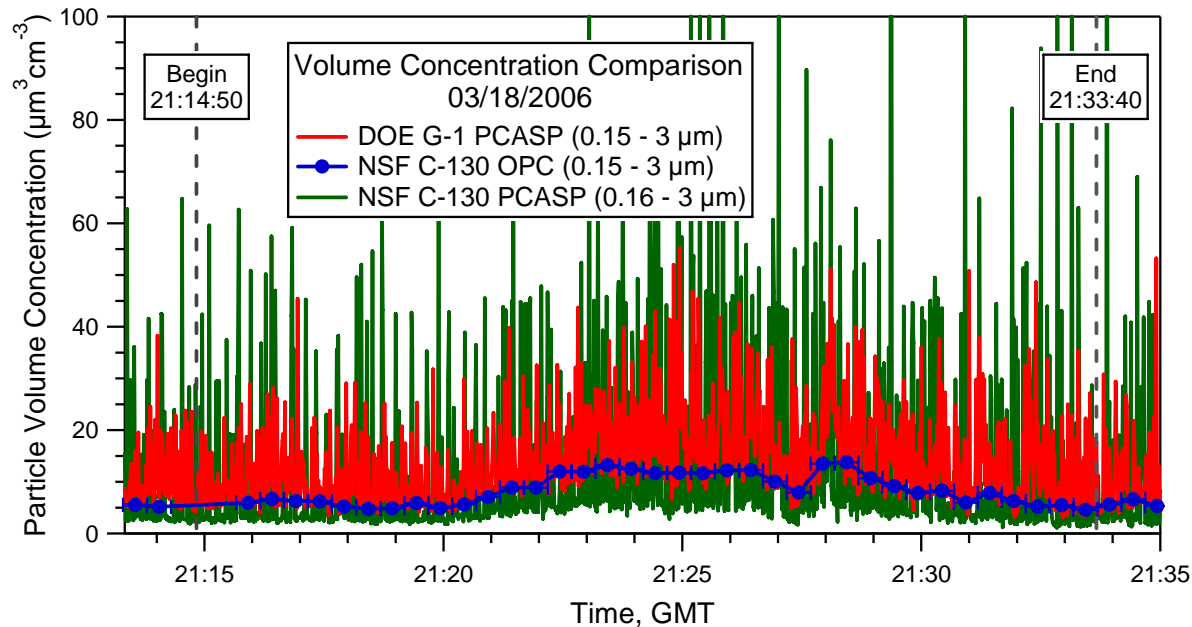
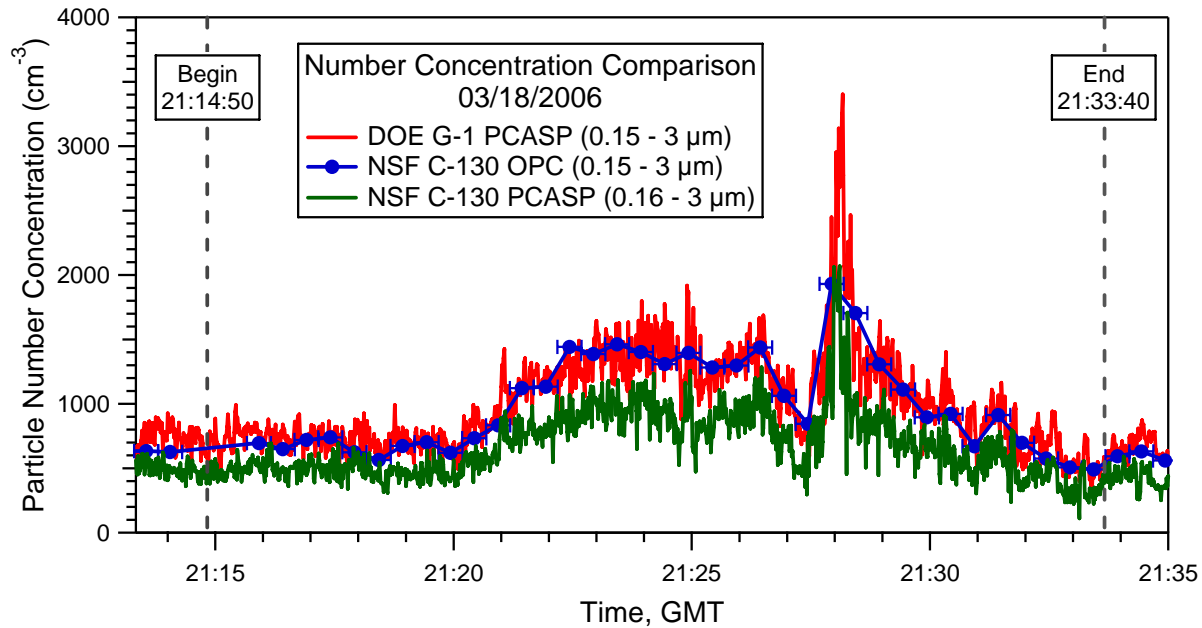


NO, NO₂, and NO_y Comparison DOE G-1 vs. NSF C-130

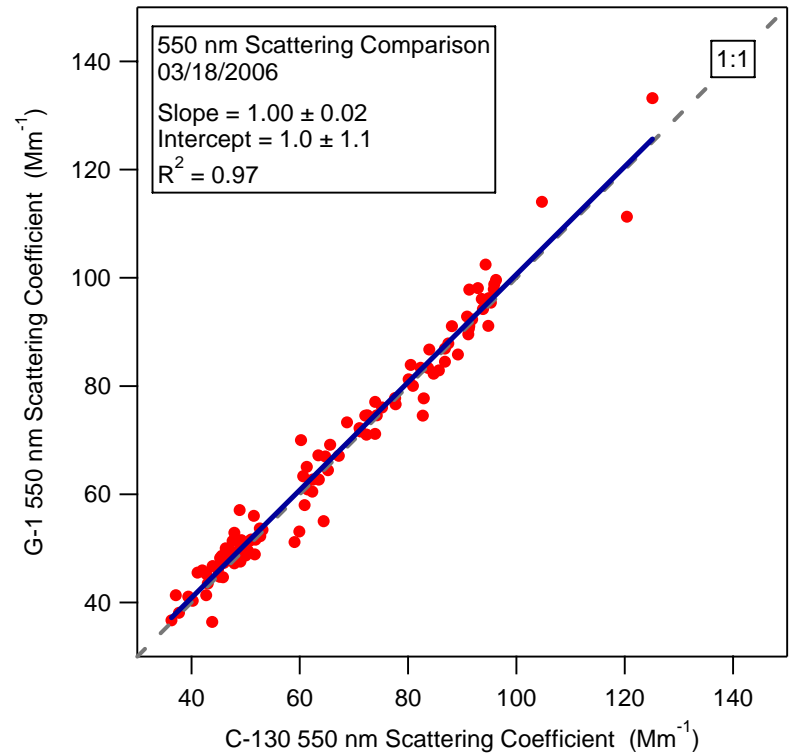
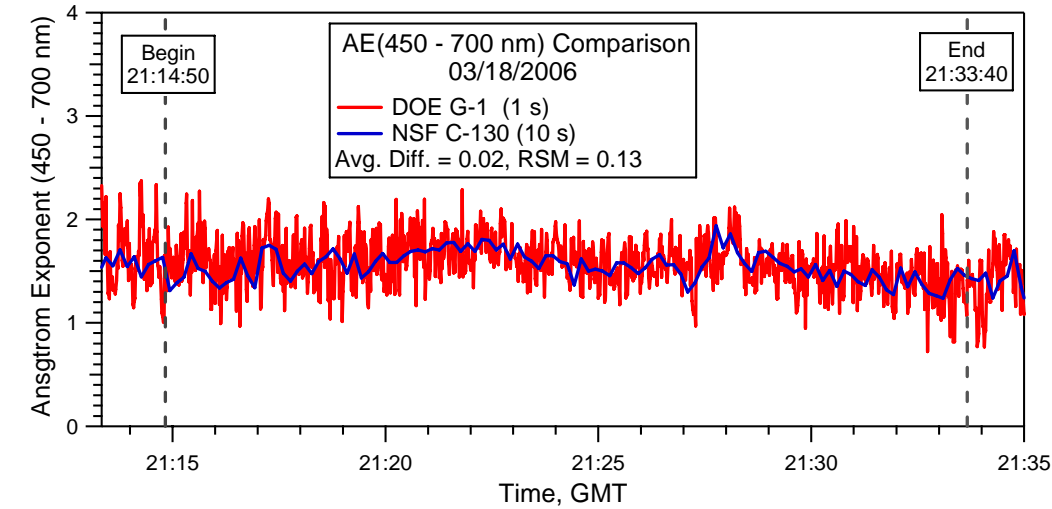
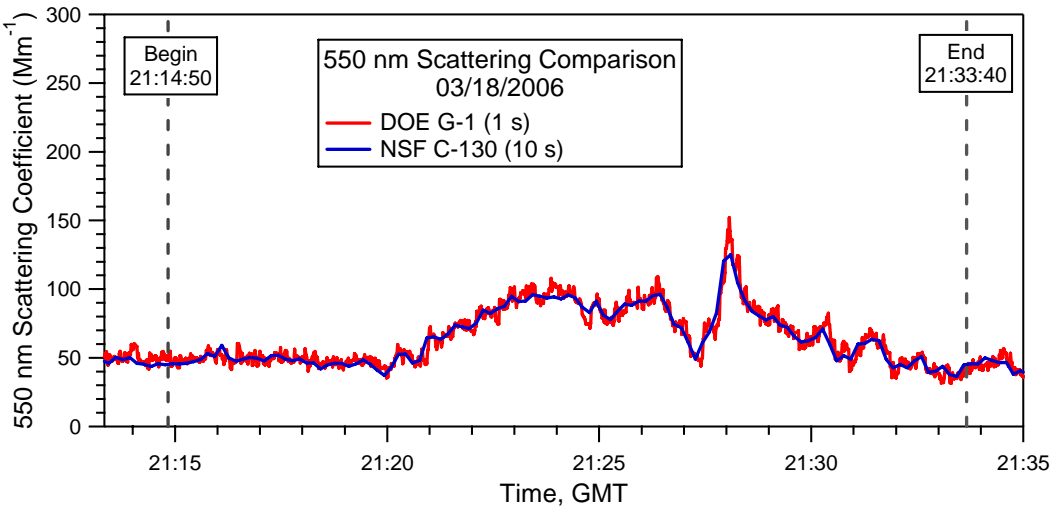


Particle Number and Volume Concentration Comparison

DOE G-1 vs. NSF C-130

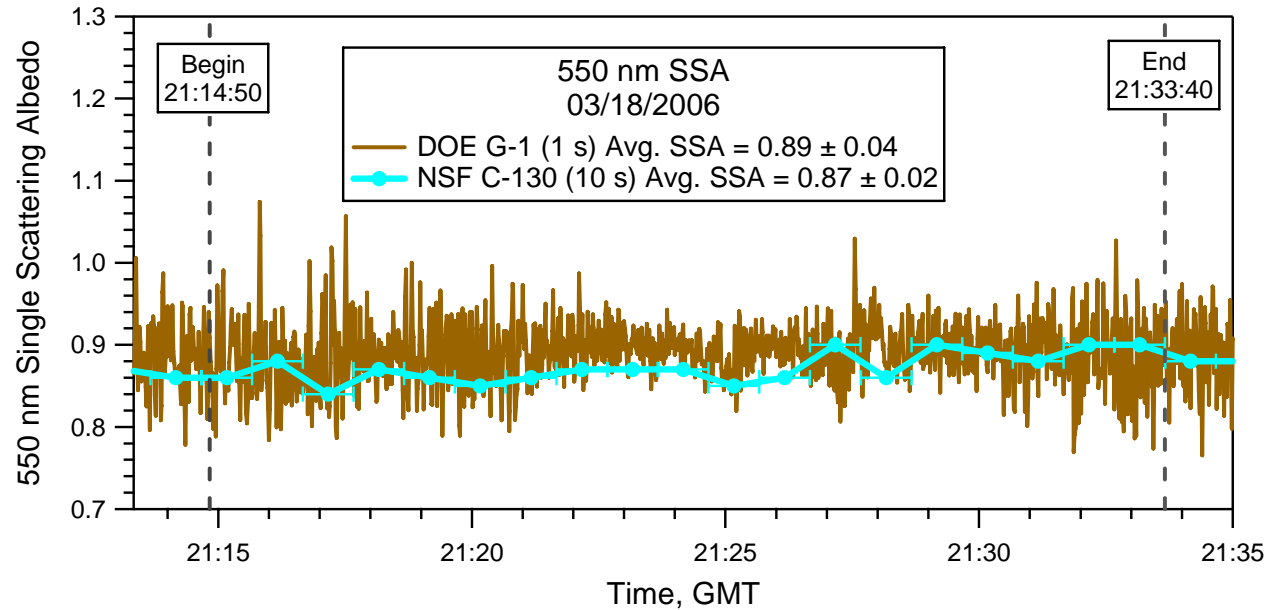
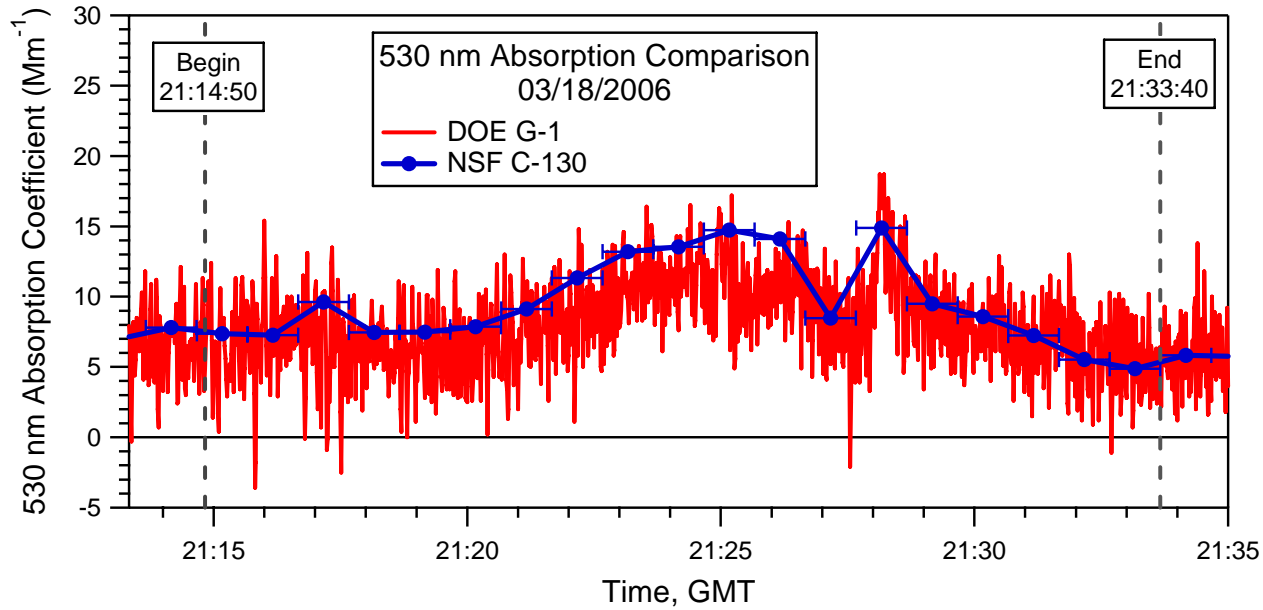


Scattering Comparison DOE G-1 vs. NSF C-130



Absorption and SSA Comparison

DOE G-1 vs. NSF C-130



Summary

- The NSF C-130 vs. NASA DC-8 is the most comprehensive one.
- We have seen increased measurement consistency as well as some isolated problems.
- Preliminary data comparison is still on-going will be released to password protected MILAGRO/INTEX-B website.
- Other comparisons will be presented at INTEX-B/IMPEX data meeting.