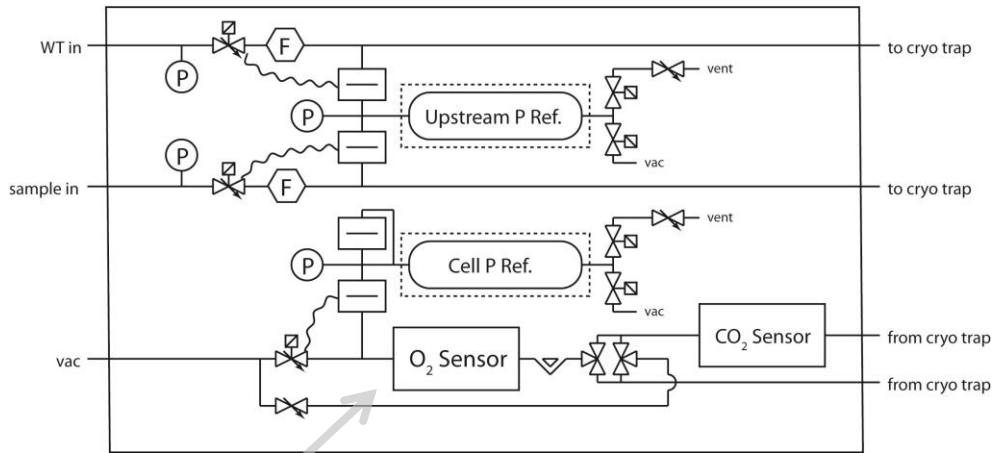


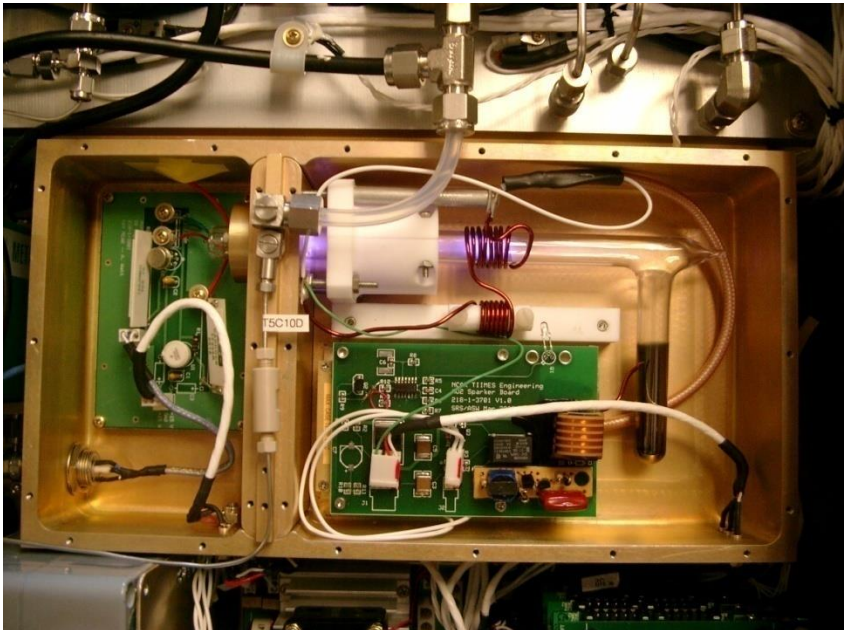
NCAR Airborne Oxygen Instrument (AO2)

Flow control:



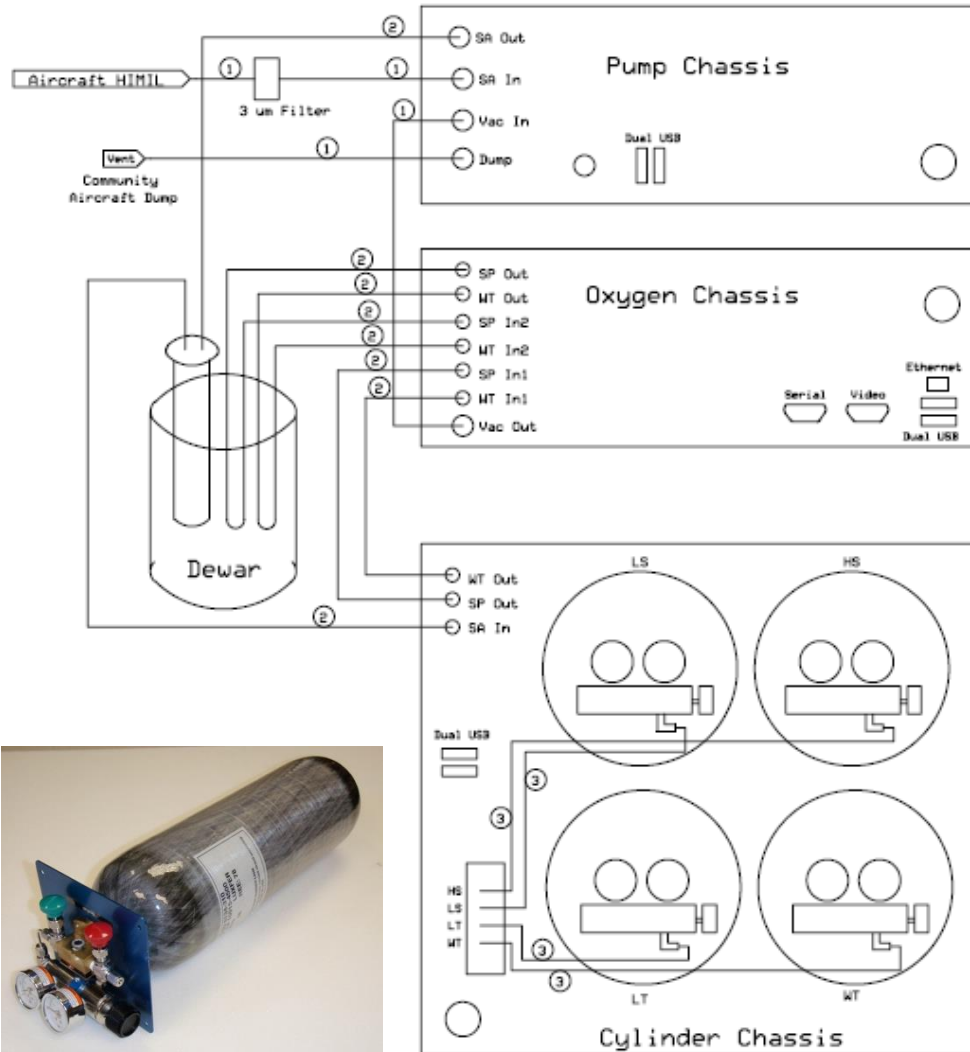
O₂ sensor

- Vacuum ultraviolet absorption technique
- Xe lamp (147 nm) and CsI detector
- Adapted from shipboard design (Stephens et al., 2003)
- Active pressure and flow control to 10^{-6}
- Switches every 2.5 seconds between sample and WT gas
- 5-second 1-sigma precision of ± 2 per meg



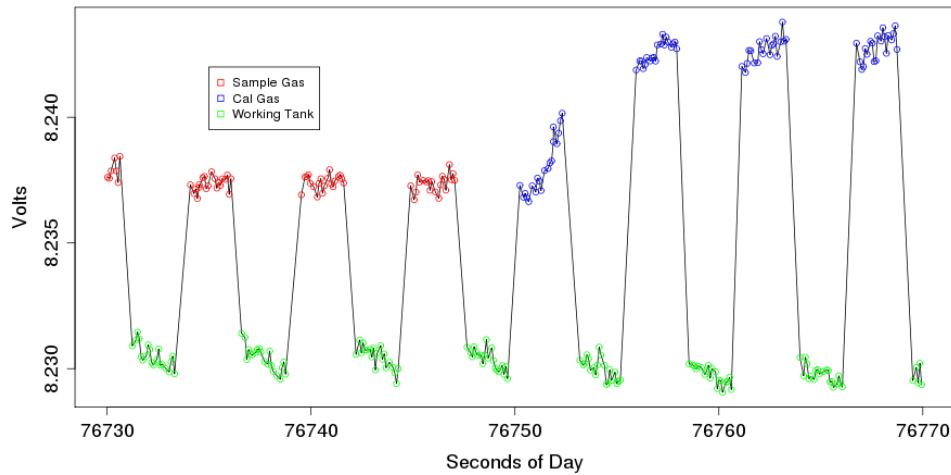
NCAR Airborne Oxygen Instrument (AO2)

System components:

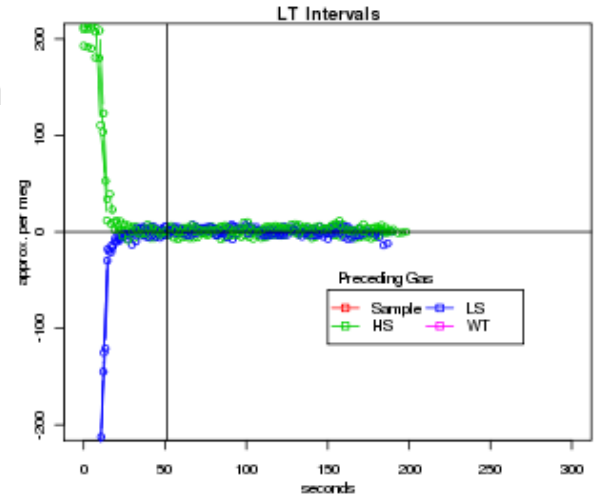


NCAR Airborne Oxygen Instrument (AO2)

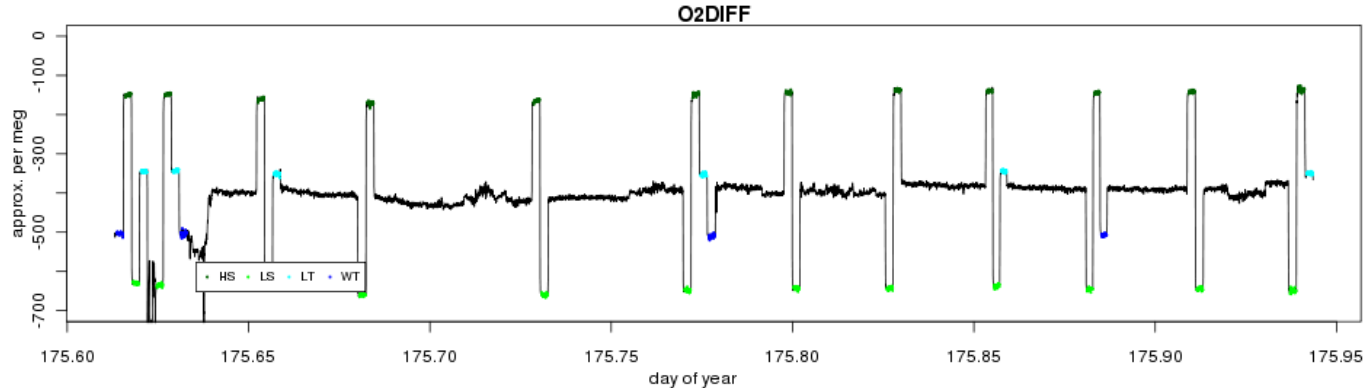
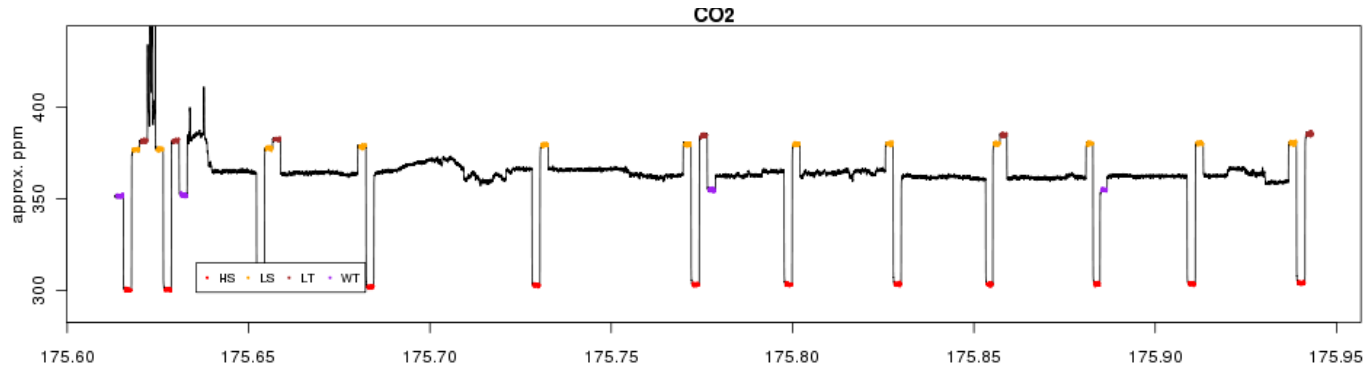
2.5-second Switching Cycle



3-min
cal

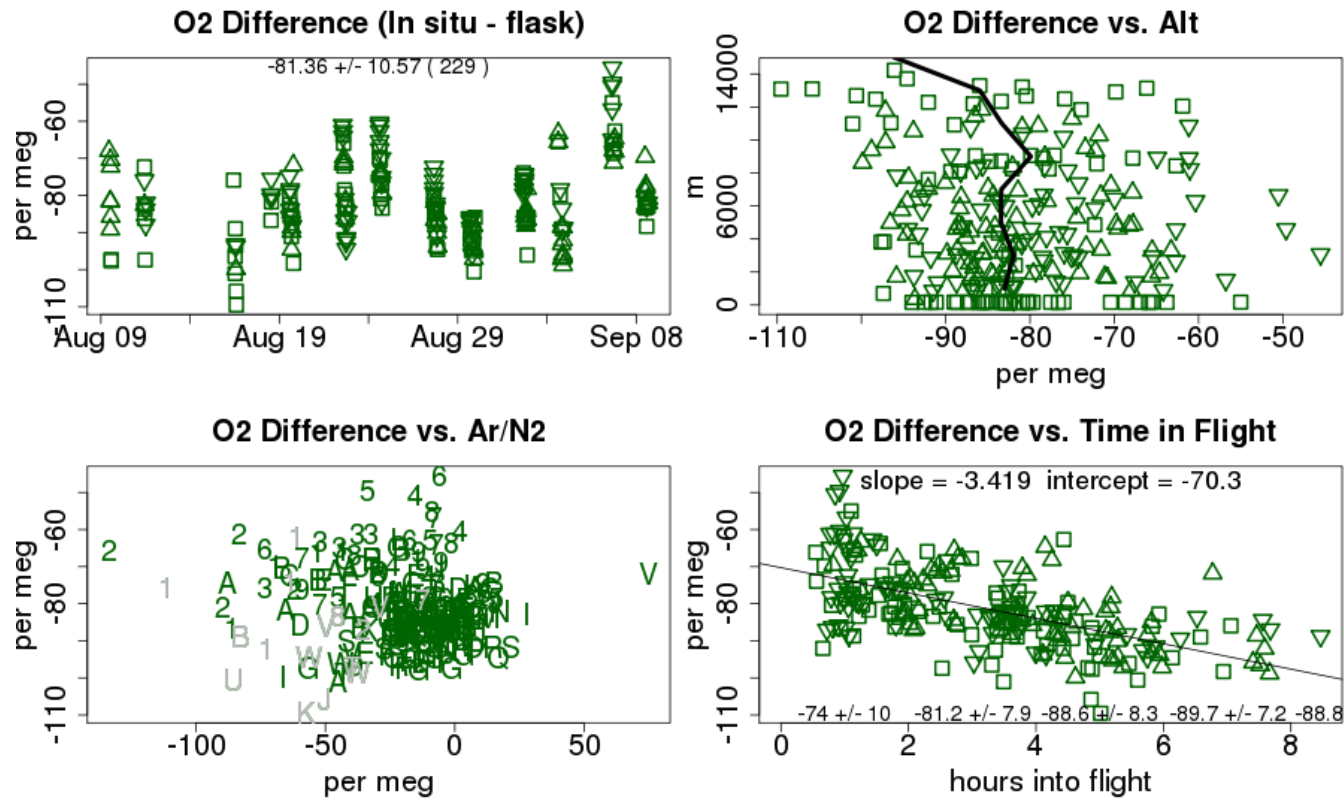


8-hour
flight



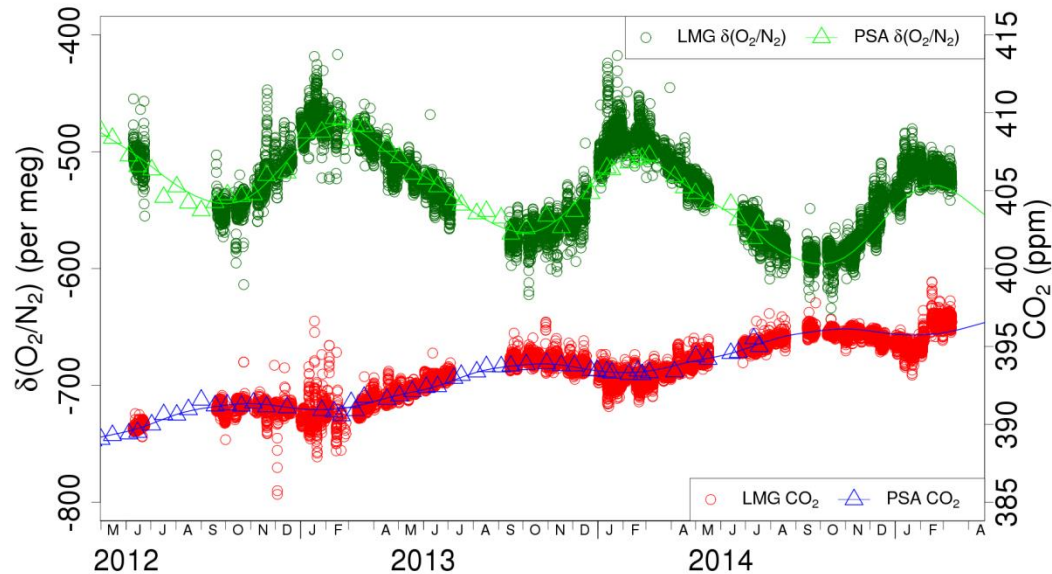
Systematic offsets from HIPPO Medusa flask samples

HIPPO5 ALL AO2



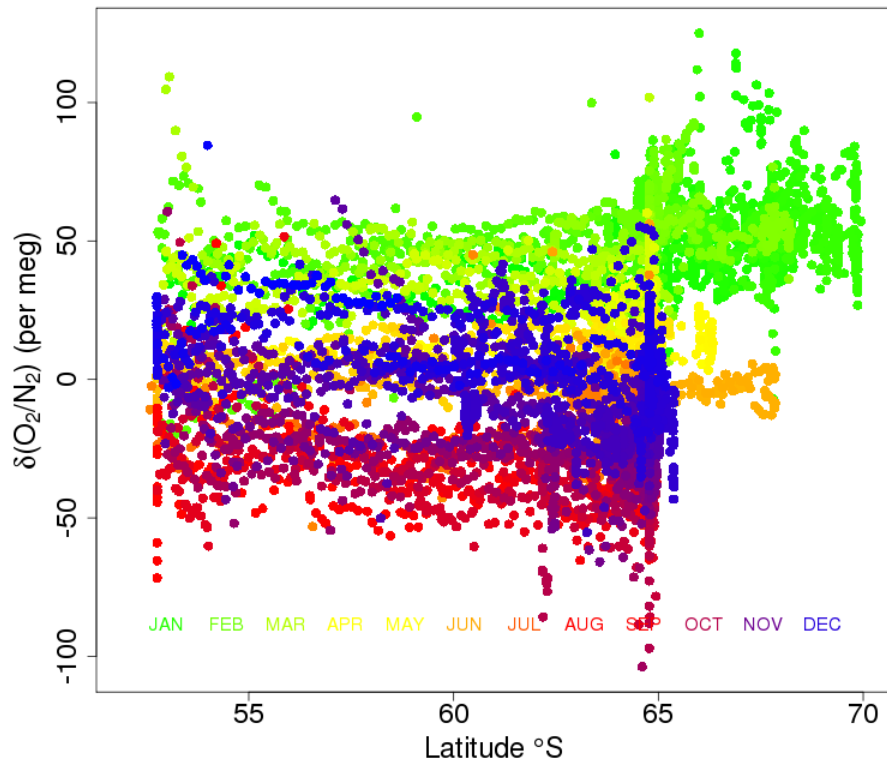
- Introduction of a small amount of fractionated cabin air at the HIMIL inlet
- Drying of calibration lines and wetting of inlet lines during flight
- Flasks agreed very well with stations, so pinned to smoothed flask values
- Both issues will be addressed prior to ORCAS. Plan to verify in ARISTO

ARSV L.M. Gould Atmospheric O₂ / CO₂ System installed in June of 2012



ARSV L.M. Gould Atmospheric O₂ and CO₂ Latitudinal Gradients

Detrended vs. Latitude



Detrended vs. Latitude

