NOAA Ozone

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UAS Ozone Instrument Science Objectives:

Make accurate O_3 measurements in the upper troposphere and lower stratosphere at 2 Hz for atmospheric composition and dynamics studies.

Instrument specifications:

(A dual-beam UV absorption ozone photometer with no consumables**)**

Size: 19" x 13.5" x 8.5"**;** **Weight:** 40 lbs; **Power:** 28VDC, ~5A

Inlet probe: A user-provided inlet/exhaust assembly mounted on Zone-12 hatch

Exhaust port: Together with the inlet

Sample frequency: 2 Hz

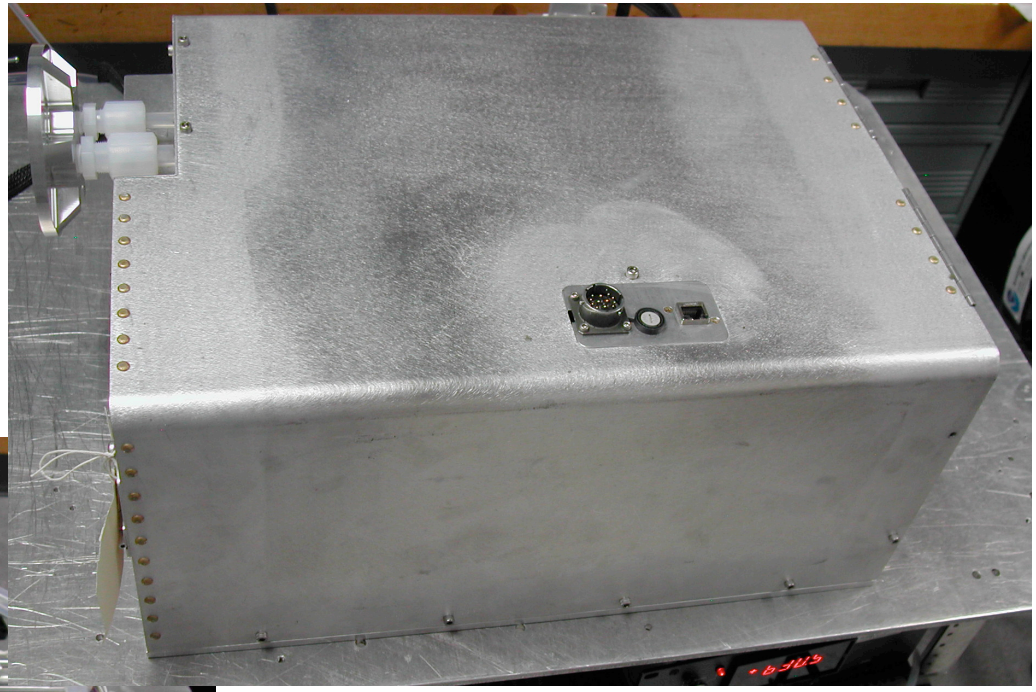
Accuracy: 5% + precision

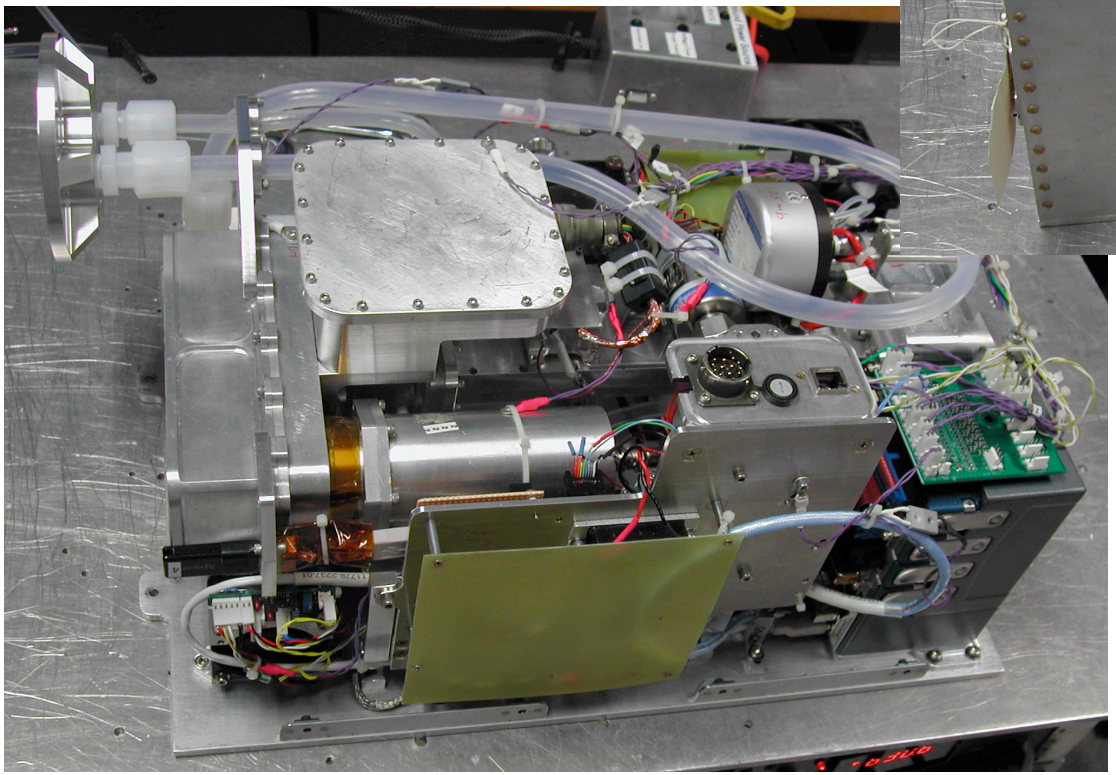
Precision: 2×10^{10} O_3/cm^3

NOAA Ozone

- Polarized UV beams are folded in 30-cm cells to achieve a 60-cm absorption length and high precision.
- Passive flow system with volume flow regulation
- 24-bit signal digitizers
- Entire system are temperature regulated

Fully assembled instrument





Without the cover

Instrument Requirements:

Control and Communication

Power Switch: On/off

Communication Bandwidth:

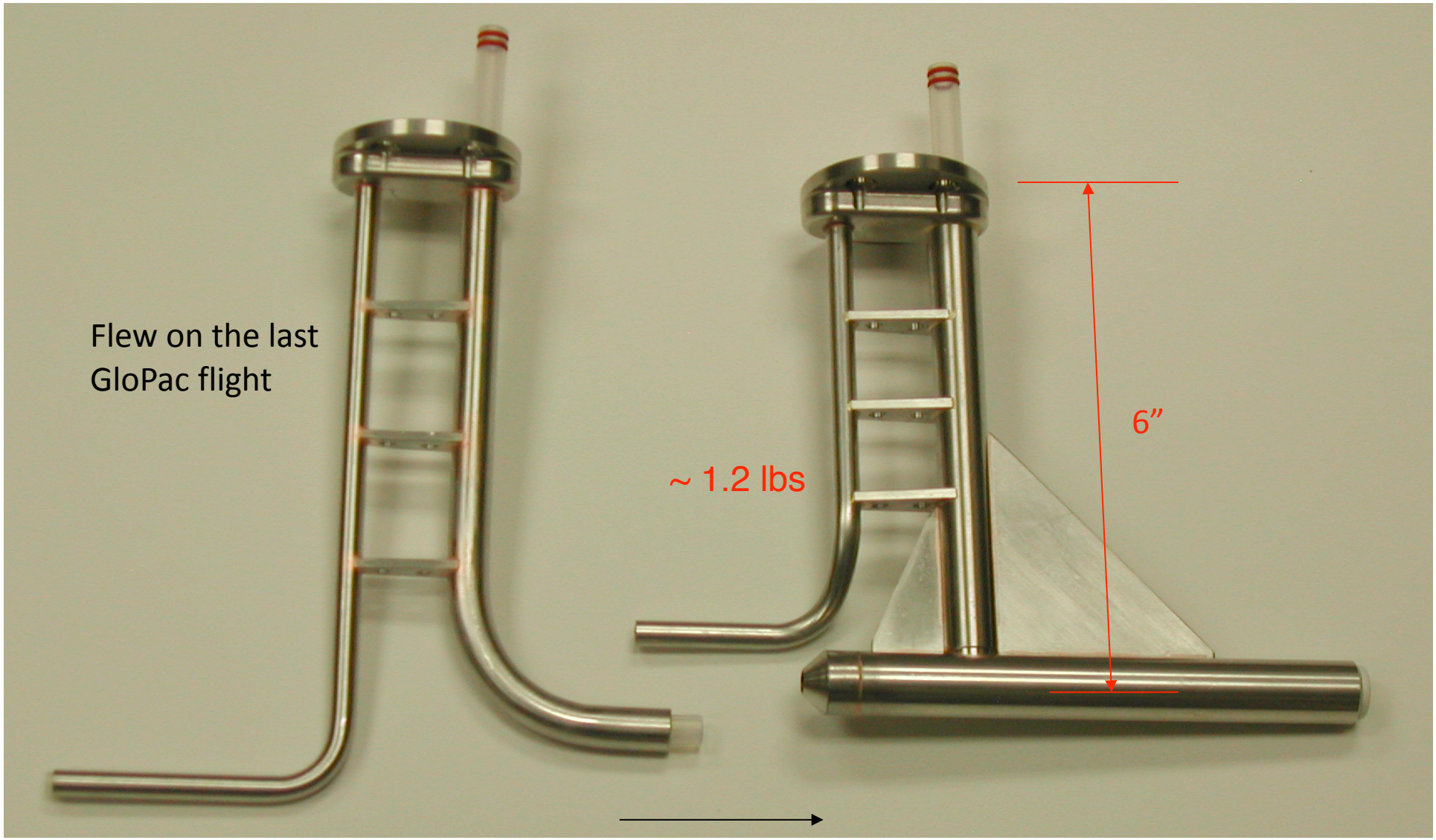
12 character/s minimum

Navigation & Time inputs:

Press, temp, lat, long, time (UT)

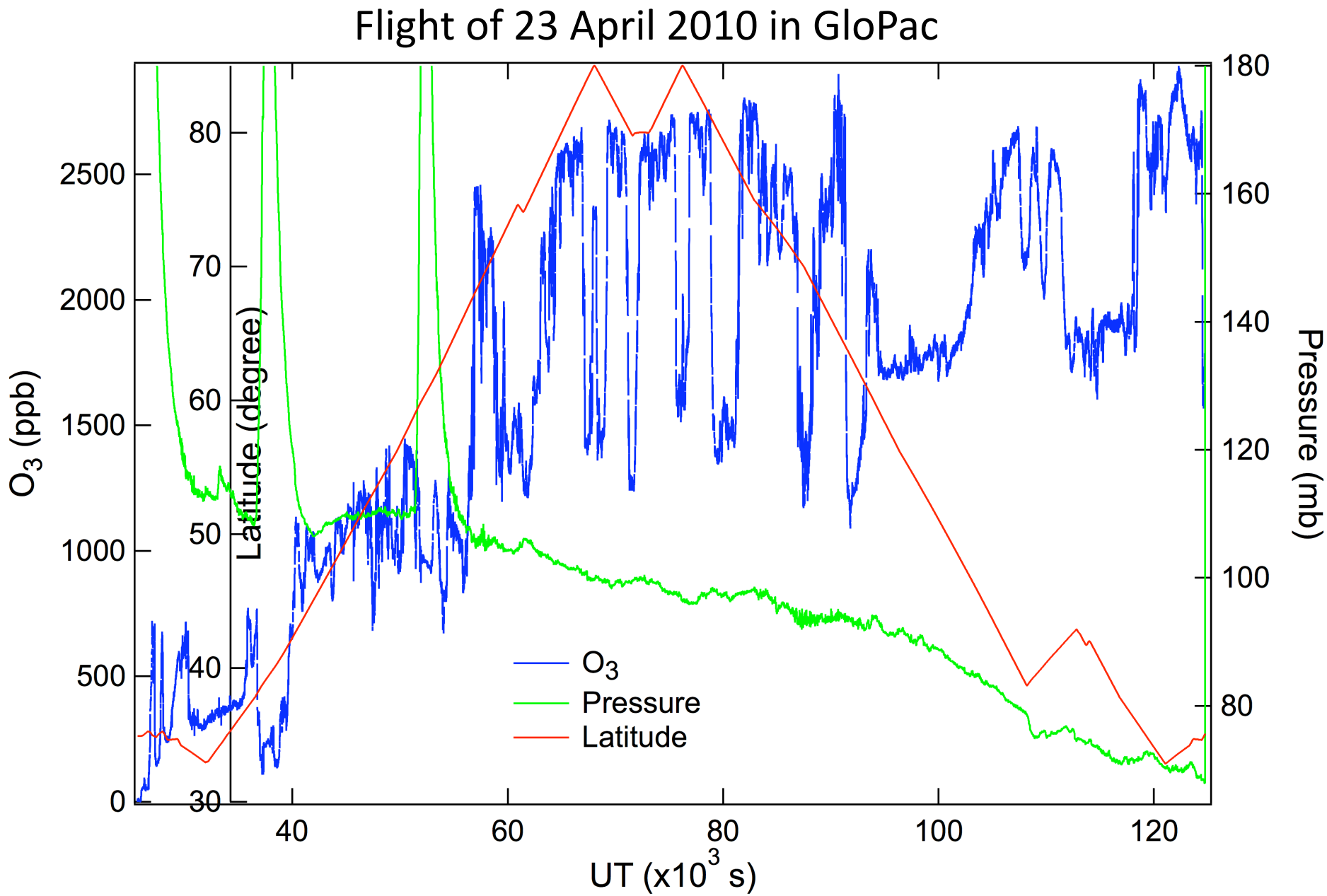
NOAA Ozone

O_3 inlet / exhaust assembly

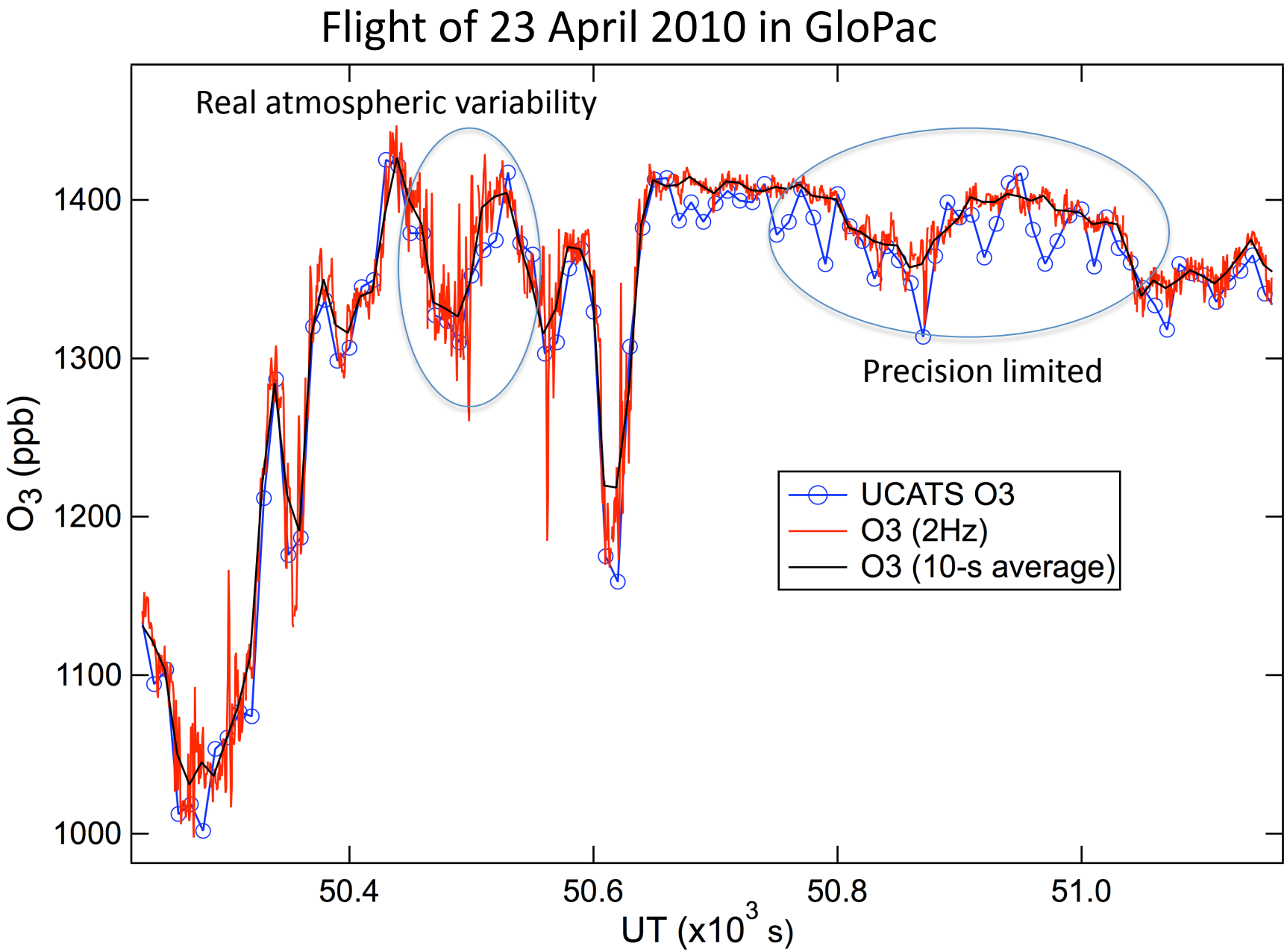


Forward

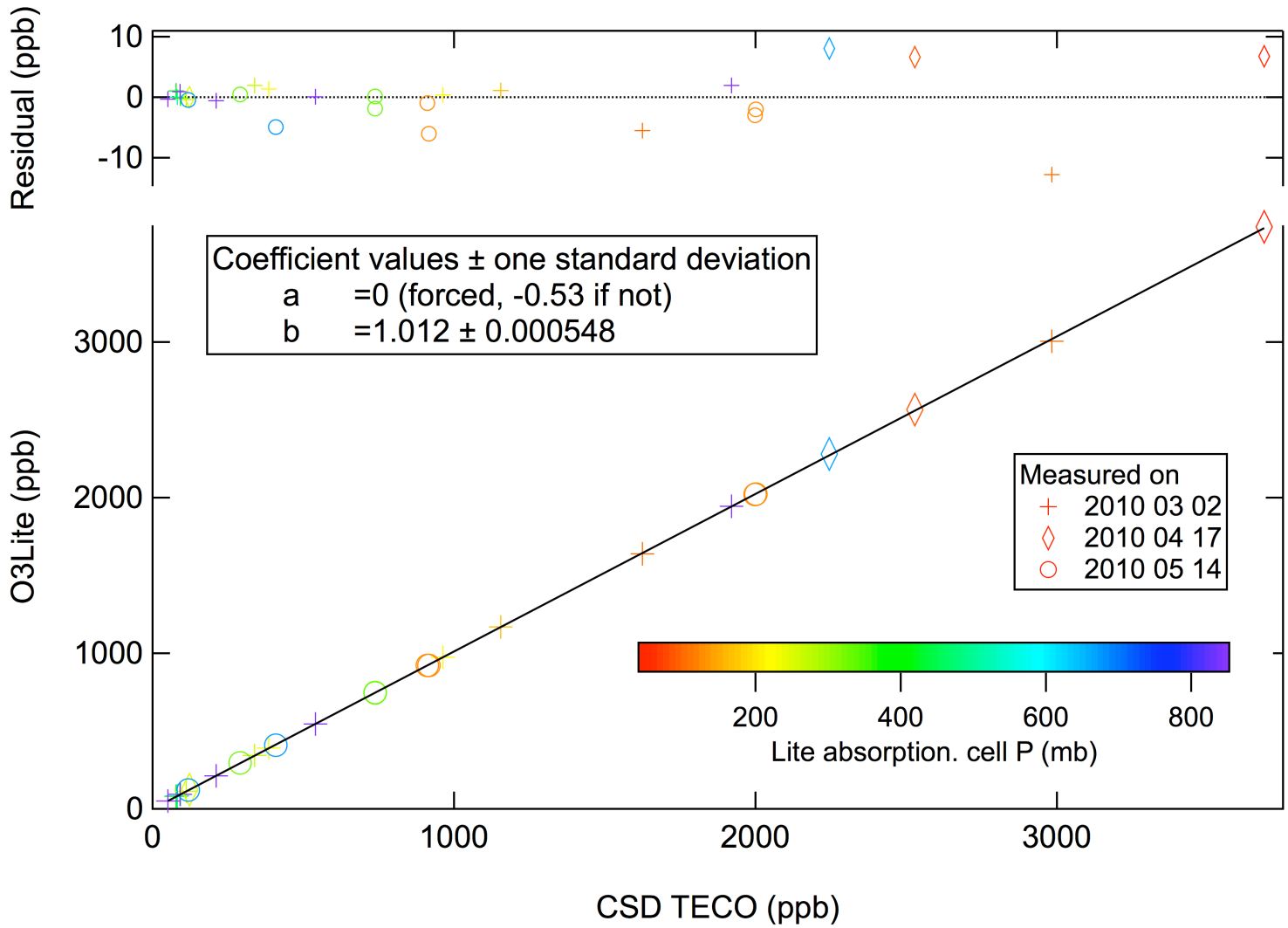
NOAA Ozone data



NOAA Ozone data

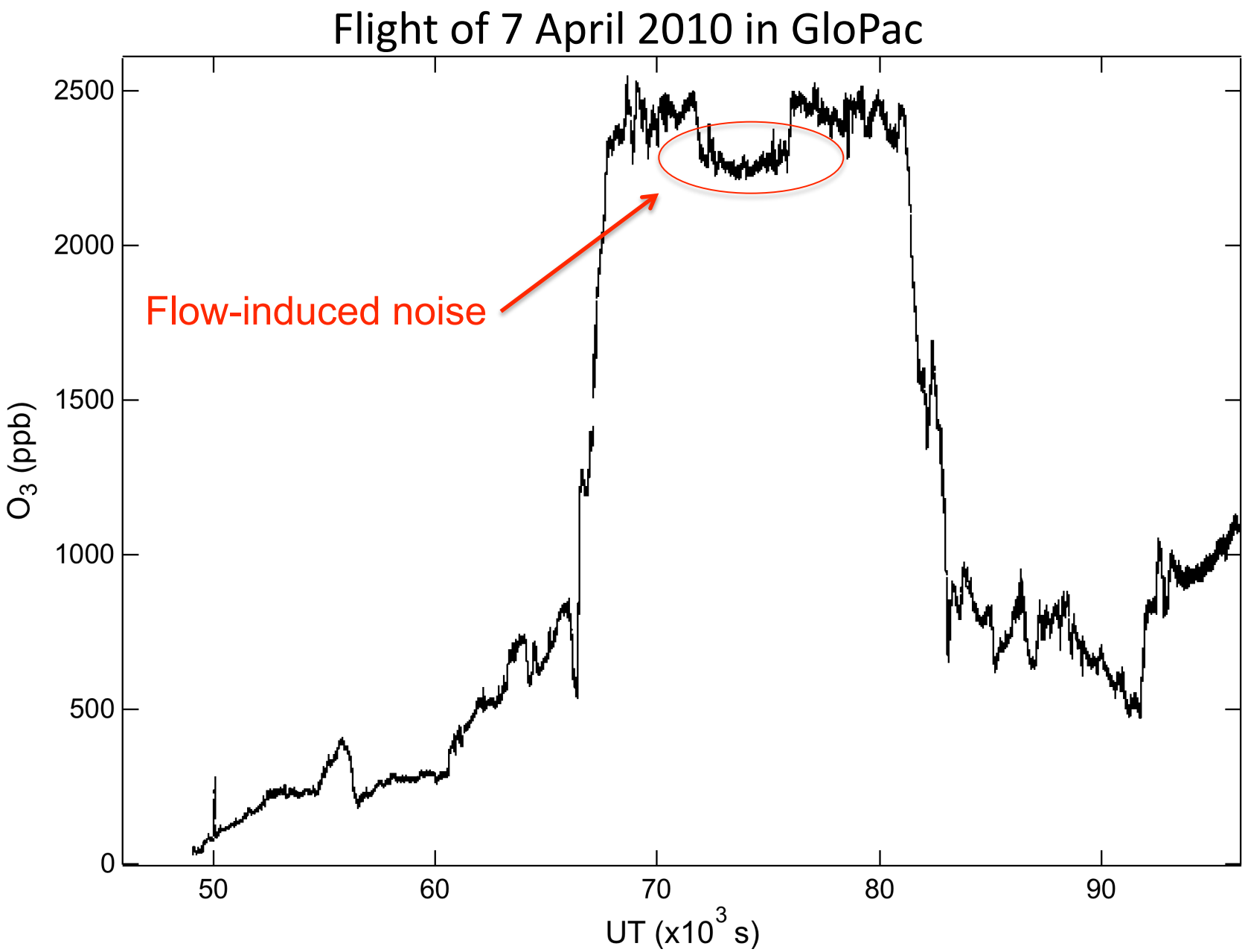


NOAA Ozone Calibration



NOAA Ozone is within 1% in intercomparisons with O3Classic (M. Proffitt/ER-2) and CSD TECO commercial instrument. Residual differences are likely due to errors in the NOAA Ozone absorption cell lengths. The folded NOAA Ozone beam doubles the length error.

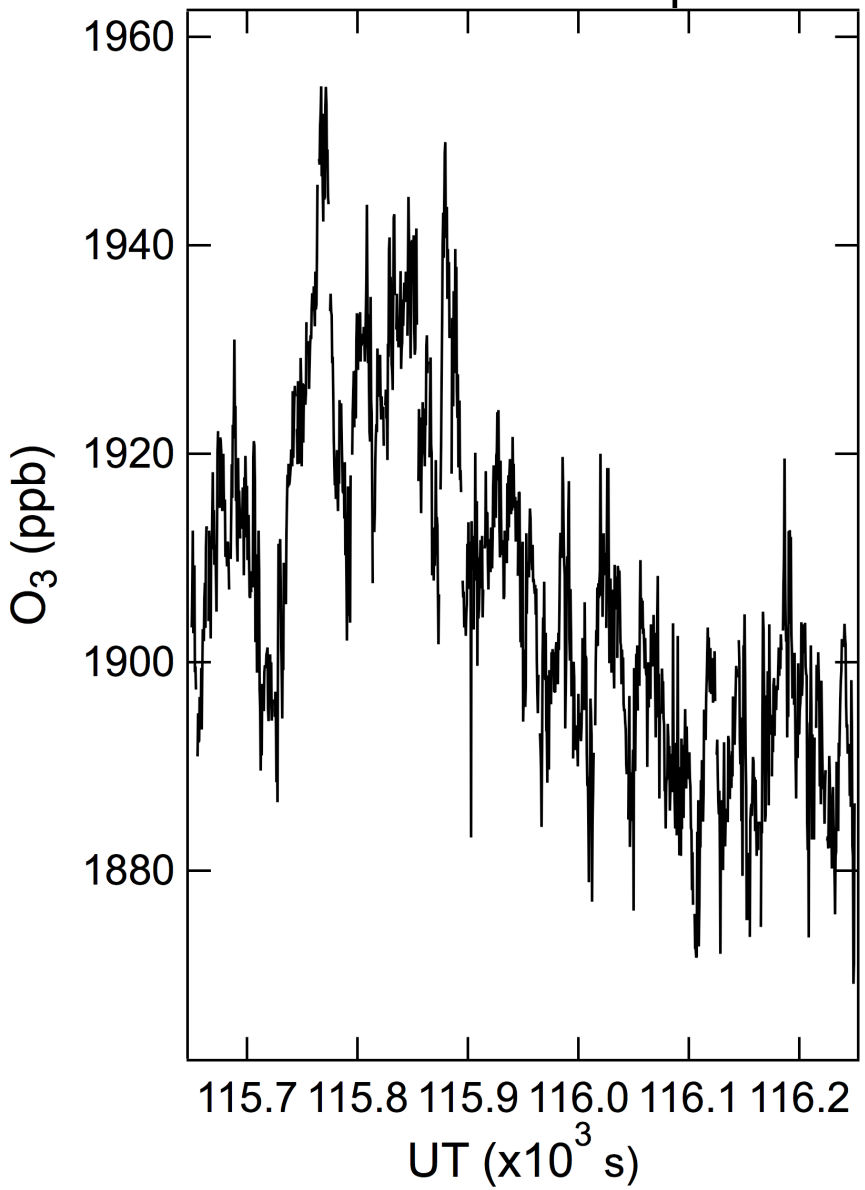
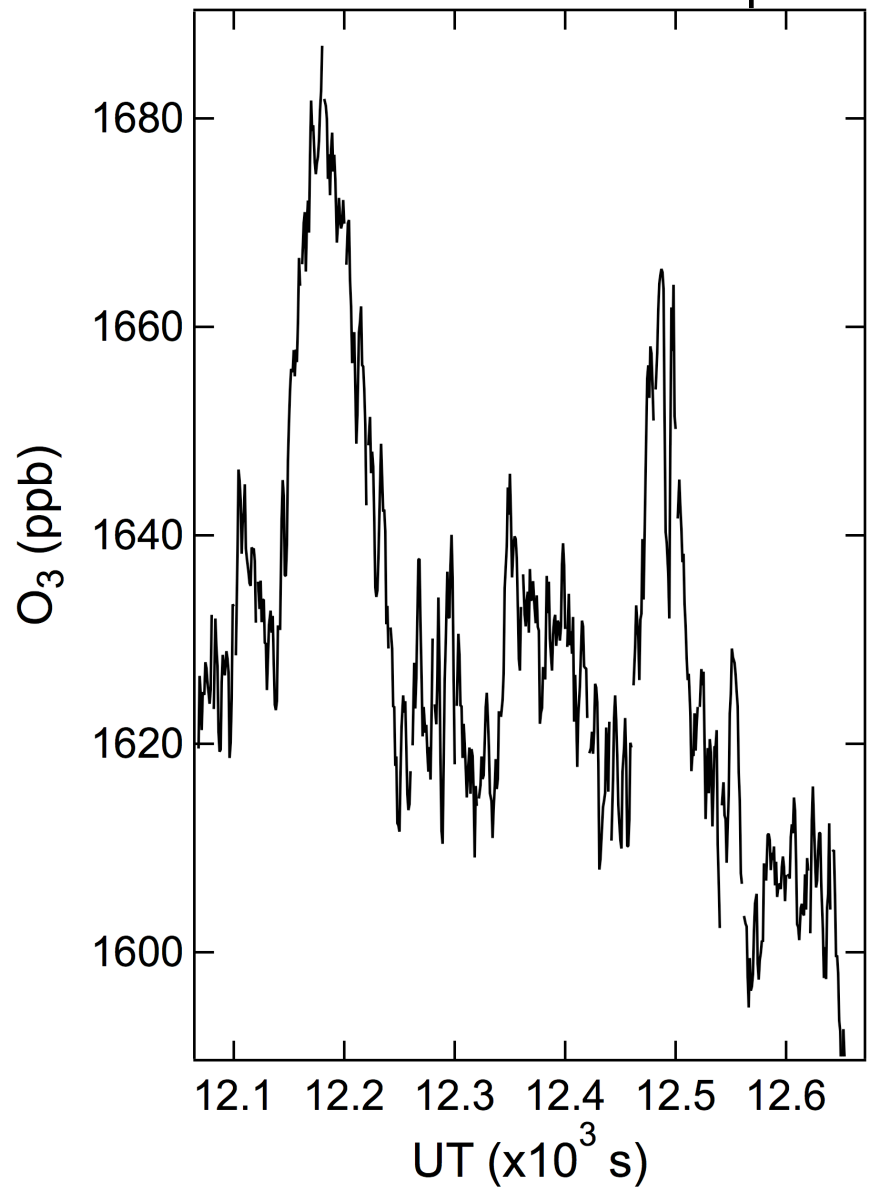
NOAA Ozone data



O_3 inlet
MMS probe

NOAA Ozone data

Flight of 23 April 2010 in GloPac
With old inlet and MMS probe



Flight of 30 April 2010 in GloPac
With new inlet and no MMS probe