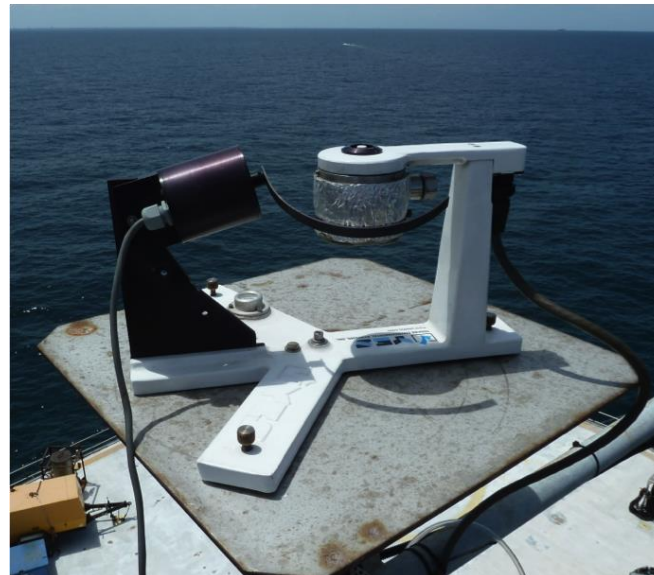


Aerosol Optical Depth, Calibration and Determination.

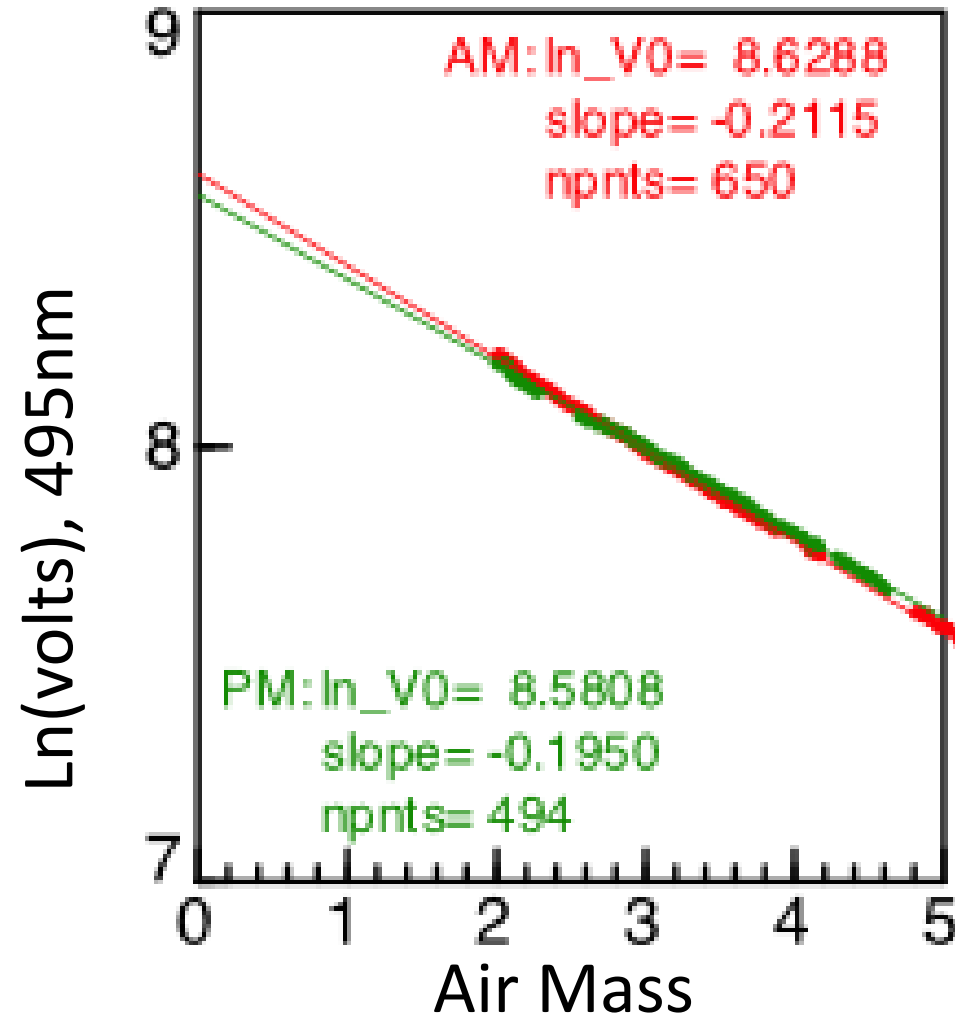
Can VOs be determined in place?

Fred Denn, Bryan Fabbri (Science Systems and Applications, Inc. (SSAI), Hampton, VA). Greg Schuster (NASA Langley Research Center, Science Directorate, Hampton, VA)

This analysis was performed using data from a Yankee Environmental Systems MultiFilter Rotating Shadowband Radiometer (MFRSR). It is one of the later units (#550) for which the temperature dependence was, presumably, solved. Data was collected At NASA Langley; Davos, CH; Mauna Loa, Hawaii; and Golden, Colorado.

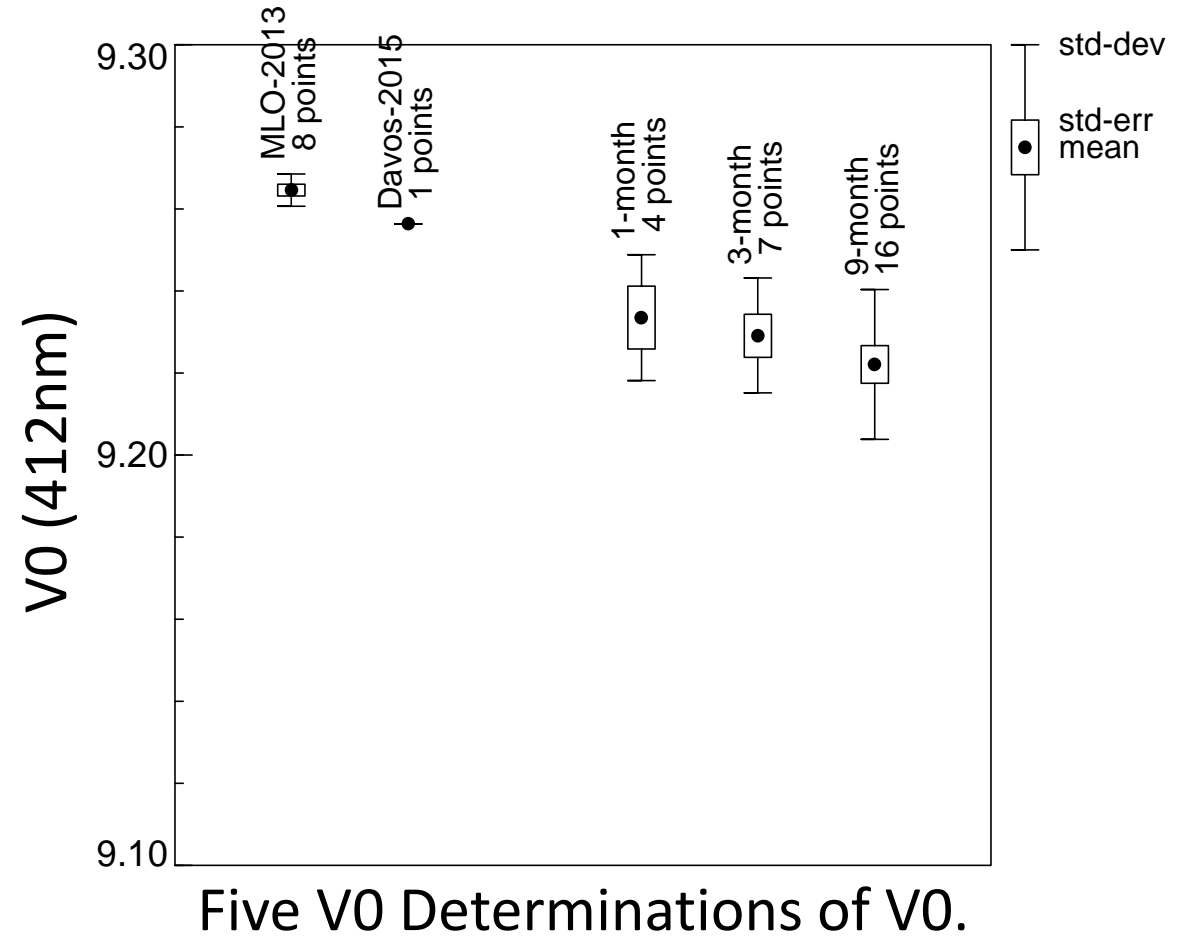
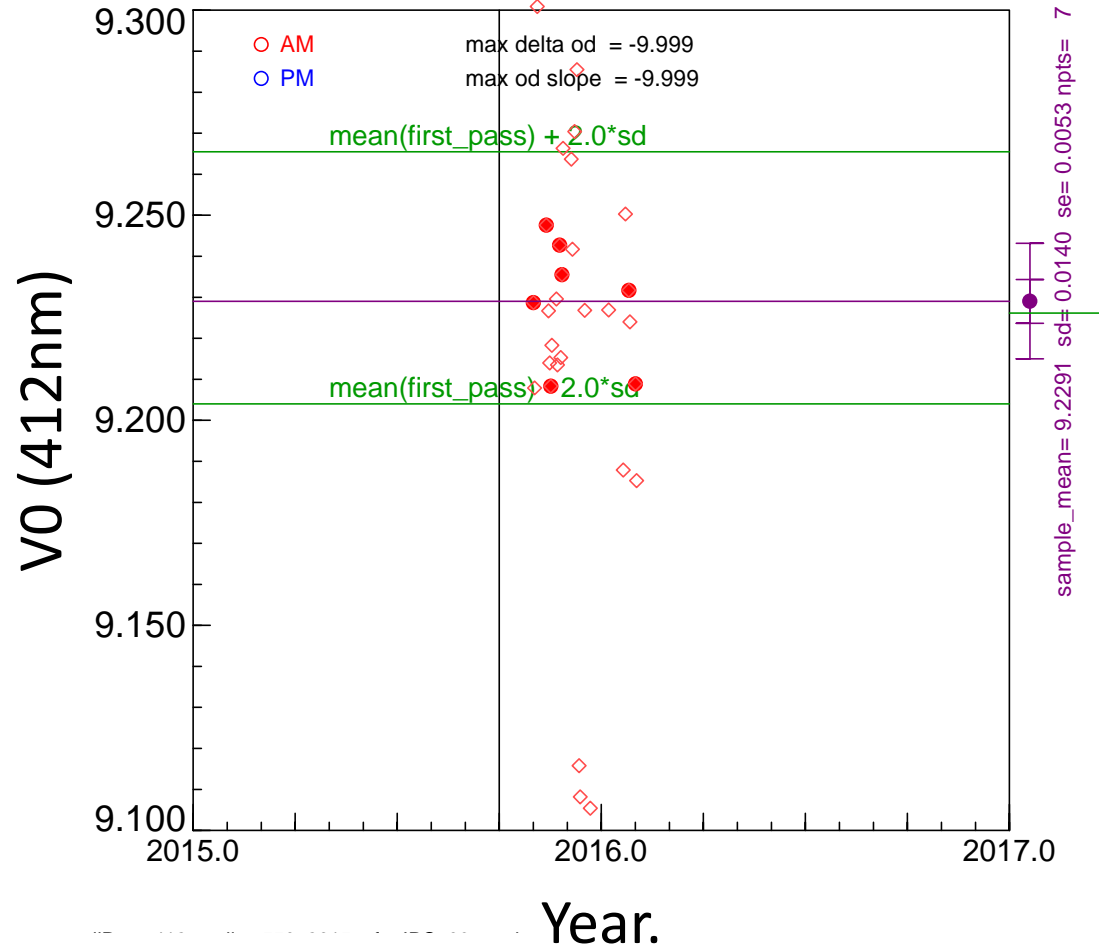


An Example of the Determination of V_0 .

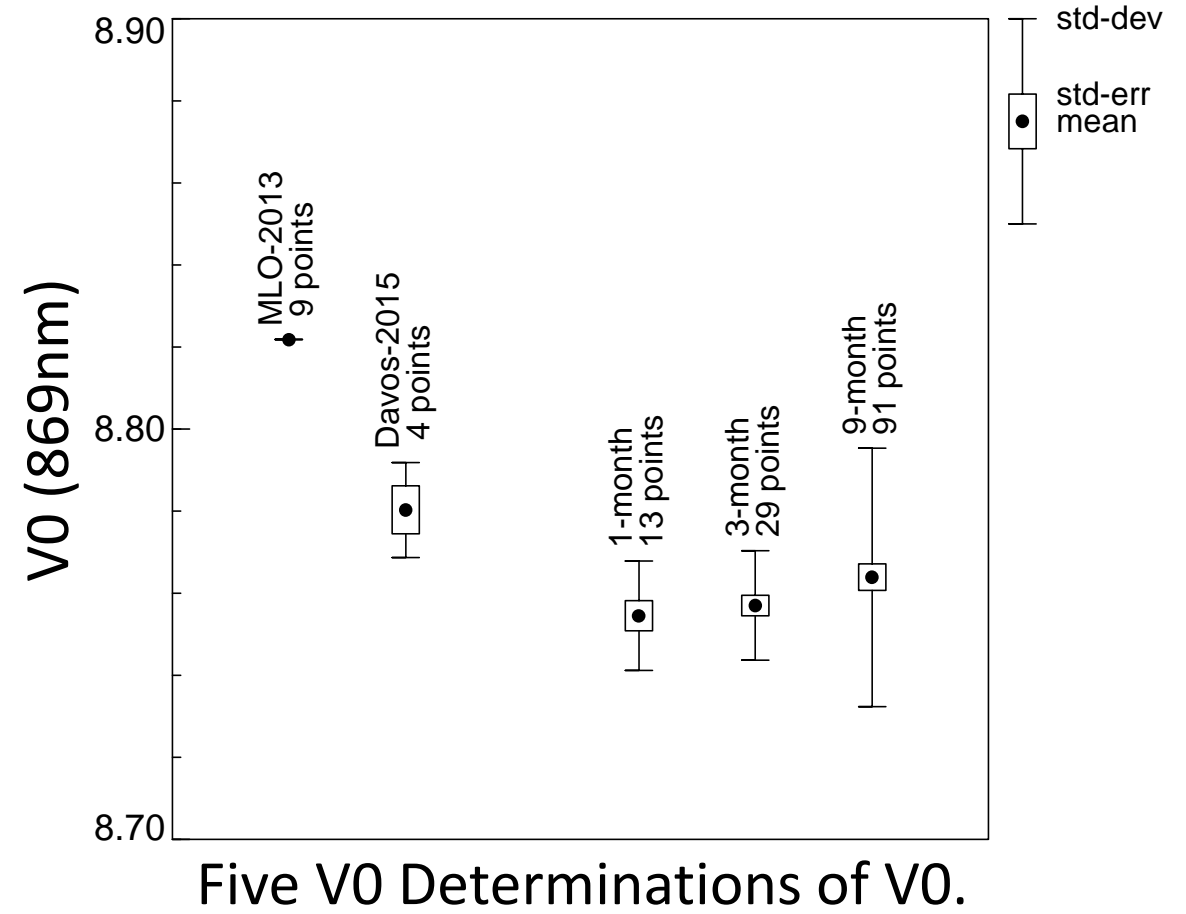
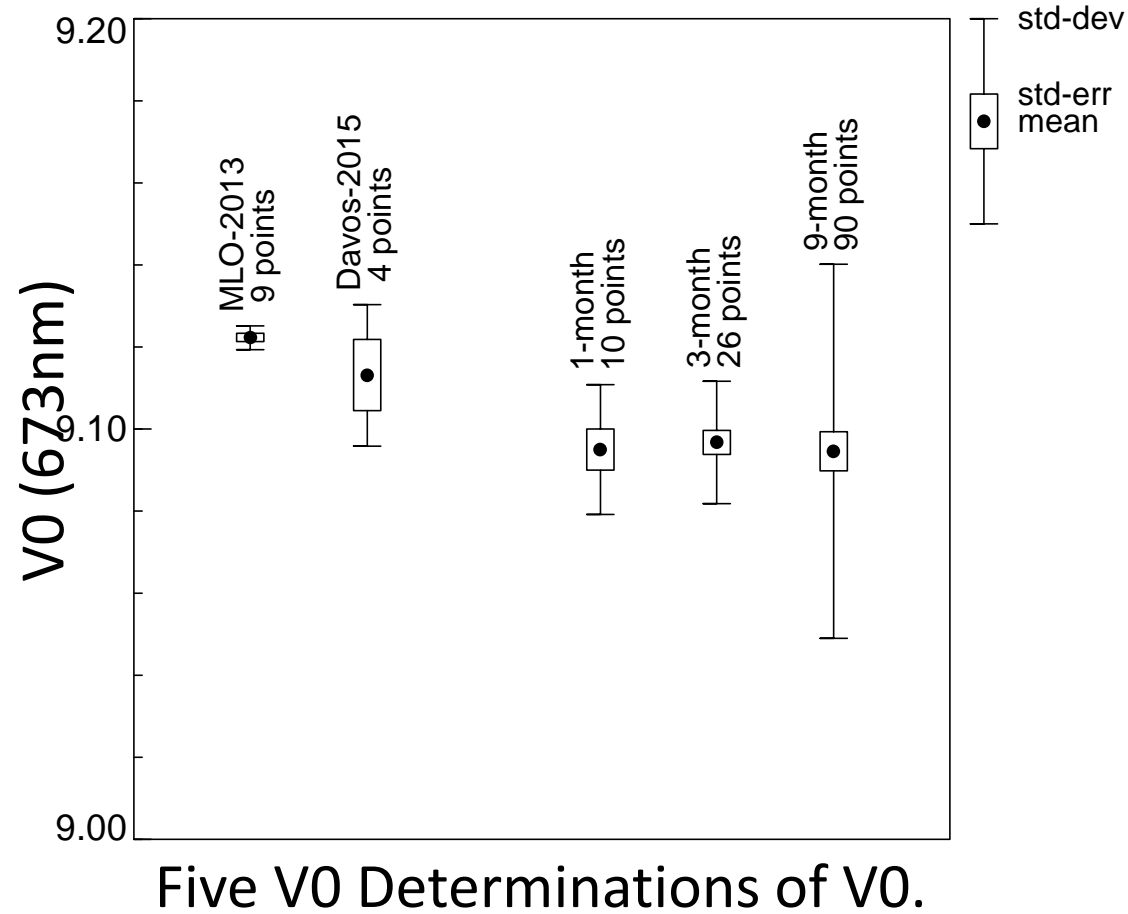


Determination of Mean V0s (Five Methods)

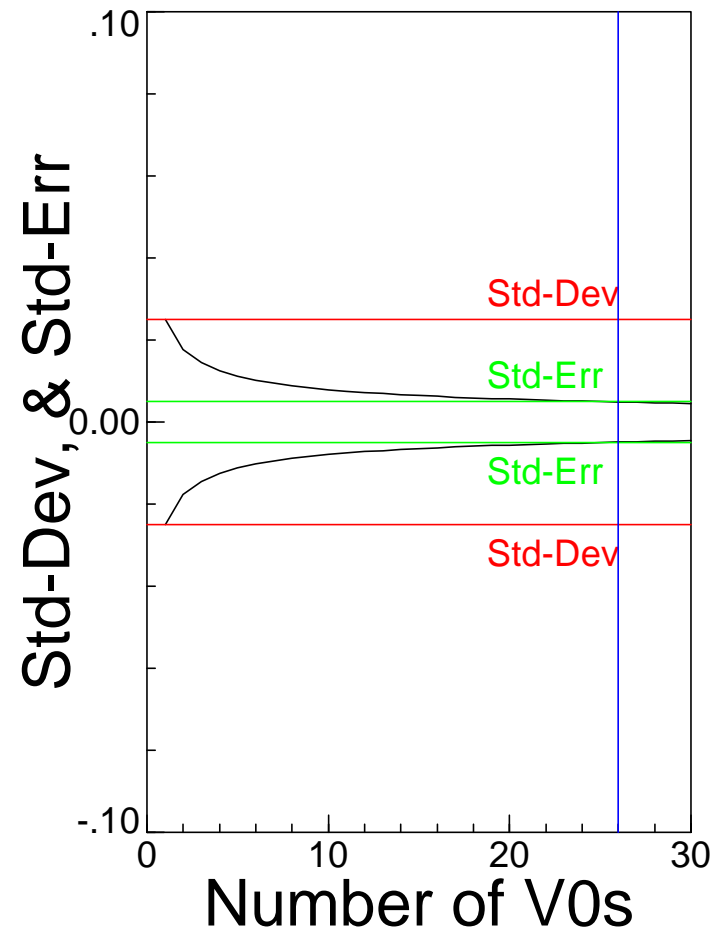
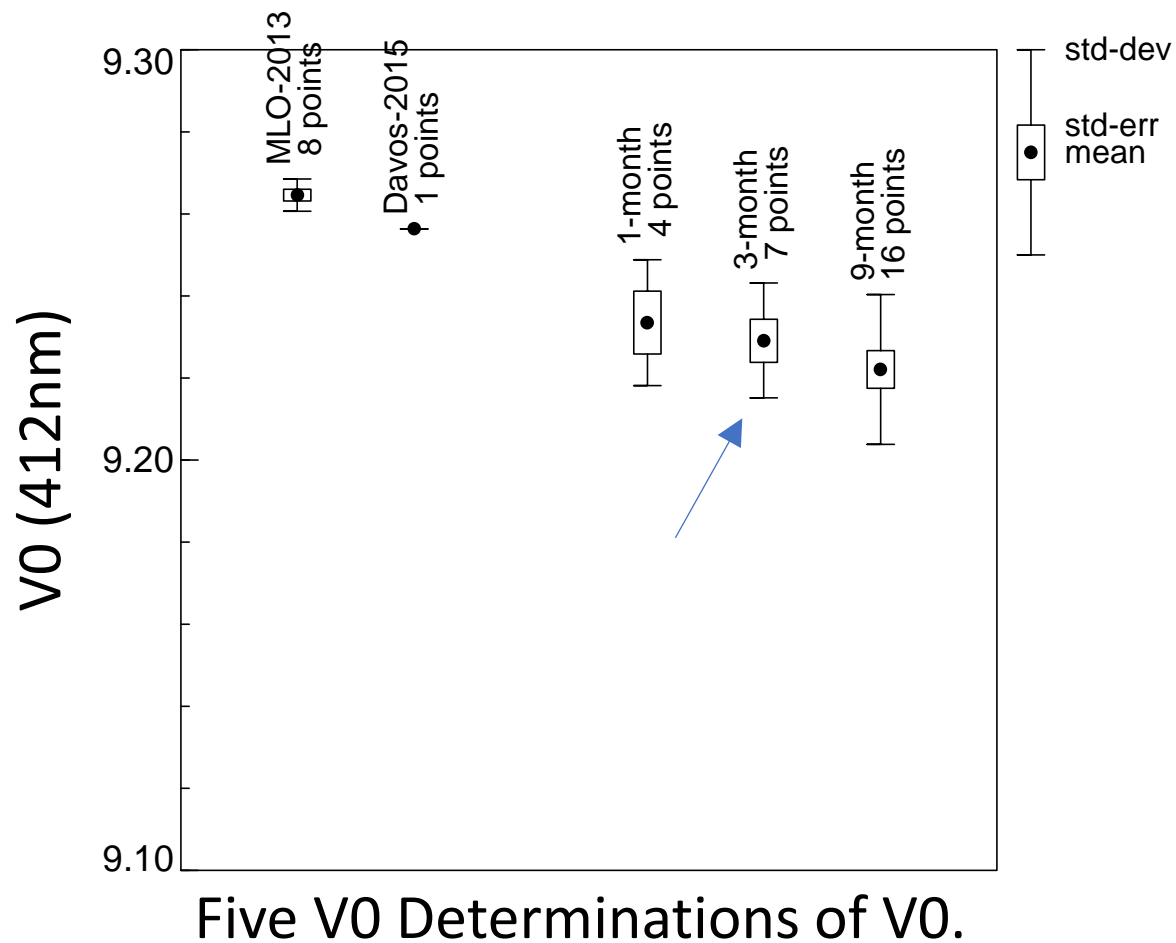
Three Months of V0s.



Determination of Mean V0s (Five Methods)



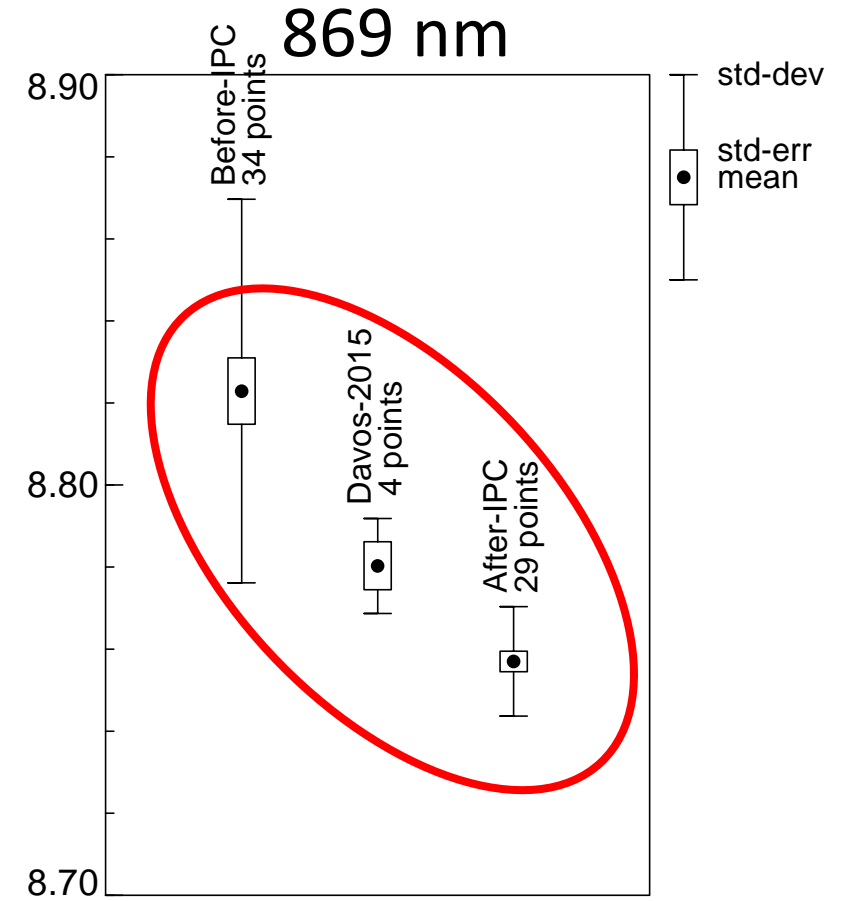
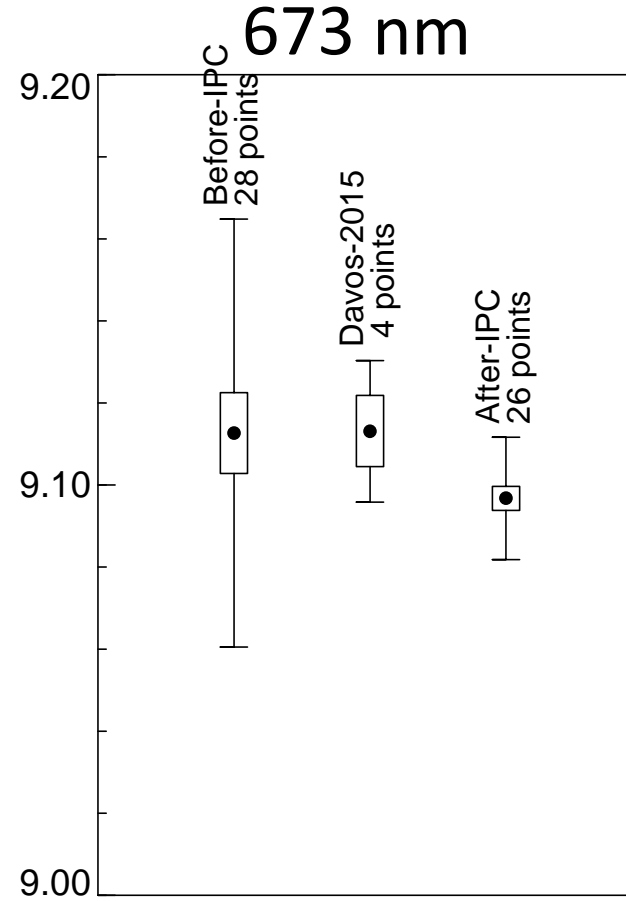
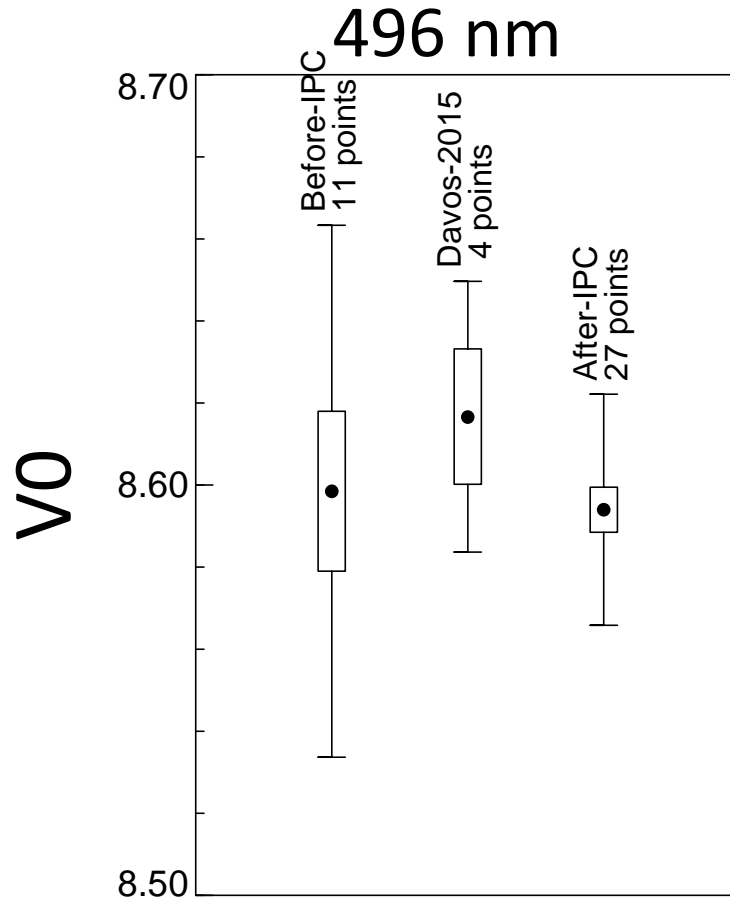
Relationship between Standard Deviation and Standard Error for a Typical 3 Month Mean V0 as the Number of V0 increases.



Some other Issues.

- 1) Shipping, damage.
- 2) Temperature dependence unknown.
- 3) Lost data while calibrating.

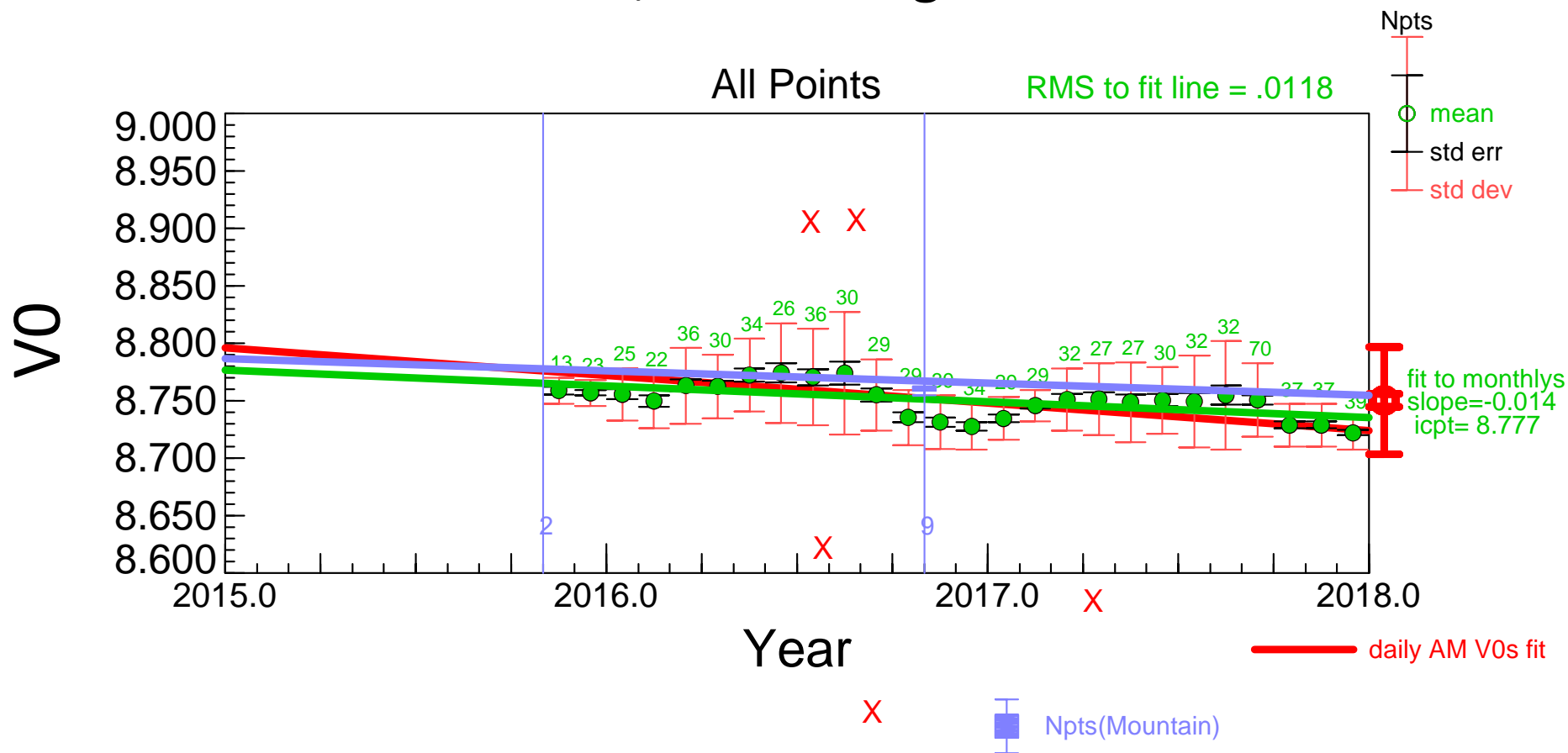
Shipping can introduce changes to an instrument
Here the 869 nm channel changed during shipping.



An example of a two year linear fit to V0 points.

An interval this long introduces errors.
Also a slow decline in the can be seen here.

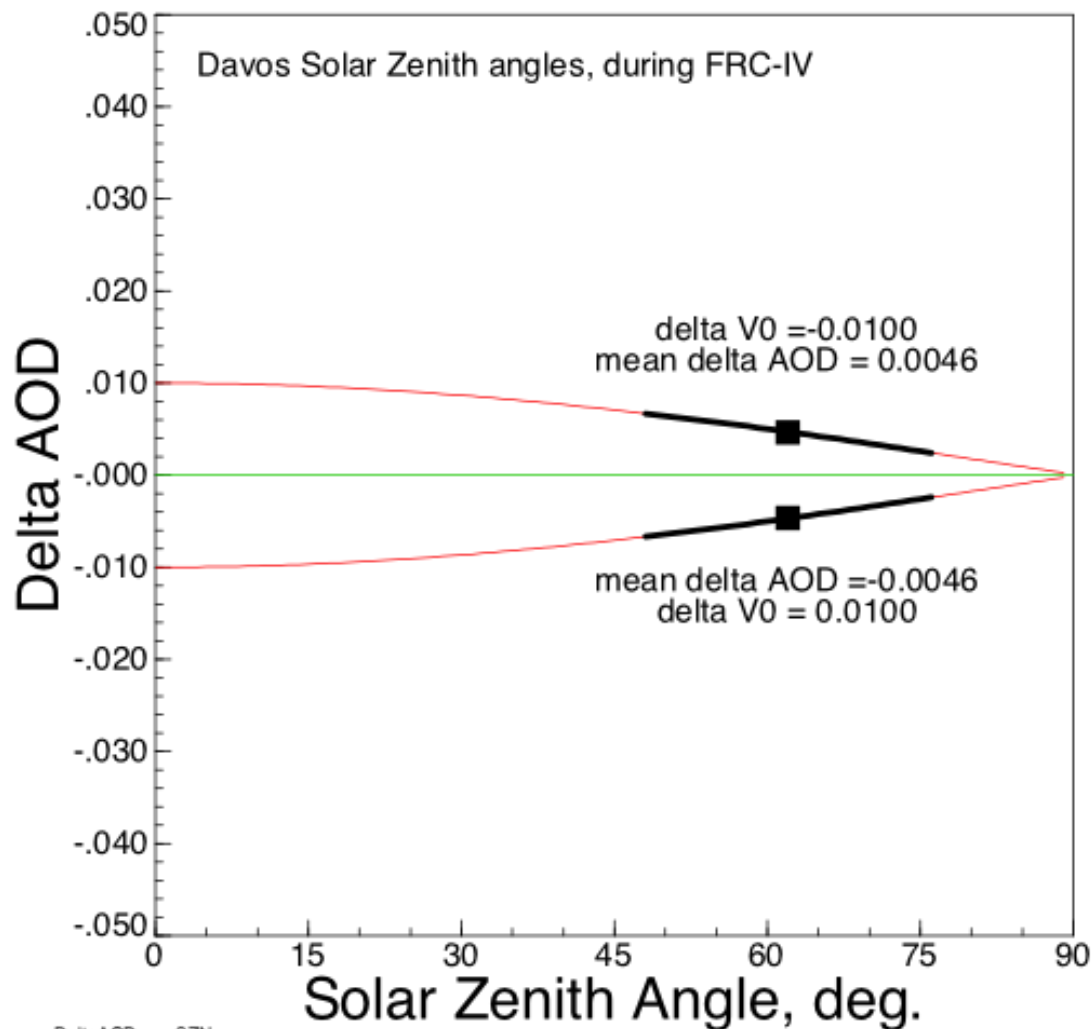
Fit to V0s, Wave Length 870nm



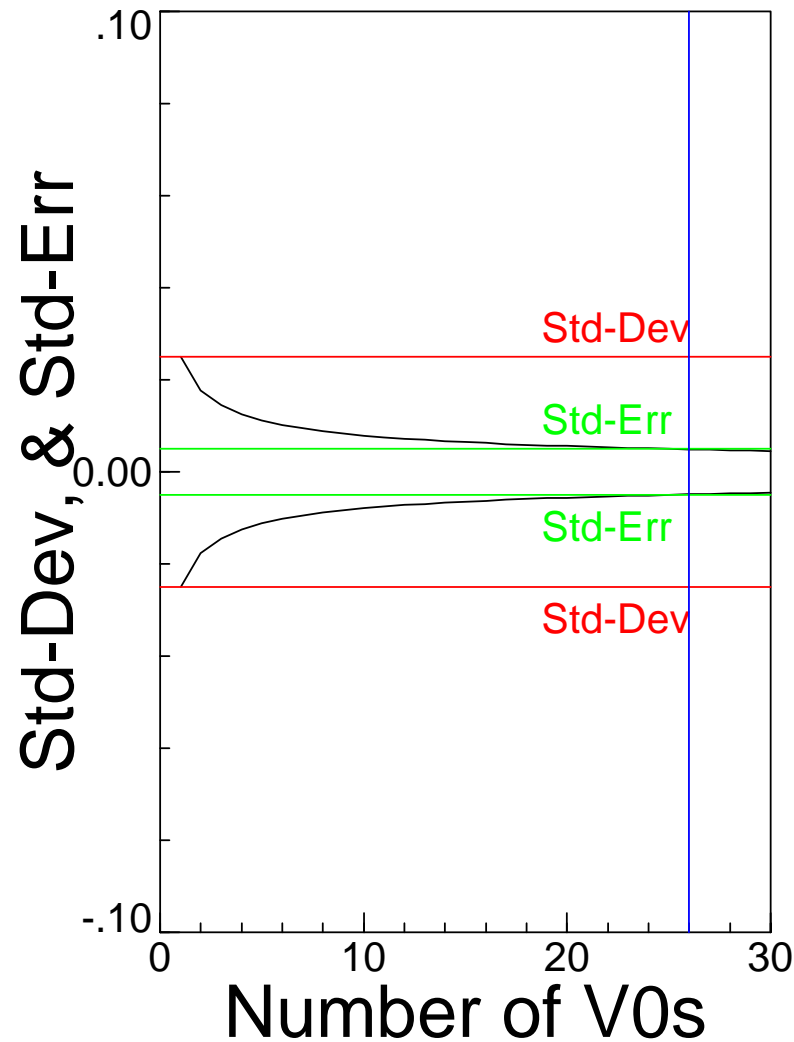
Effect of a change in V0 on resulting AOD Measurements.

Here during the Filter Radiometer Comparison held during IPC-2015.

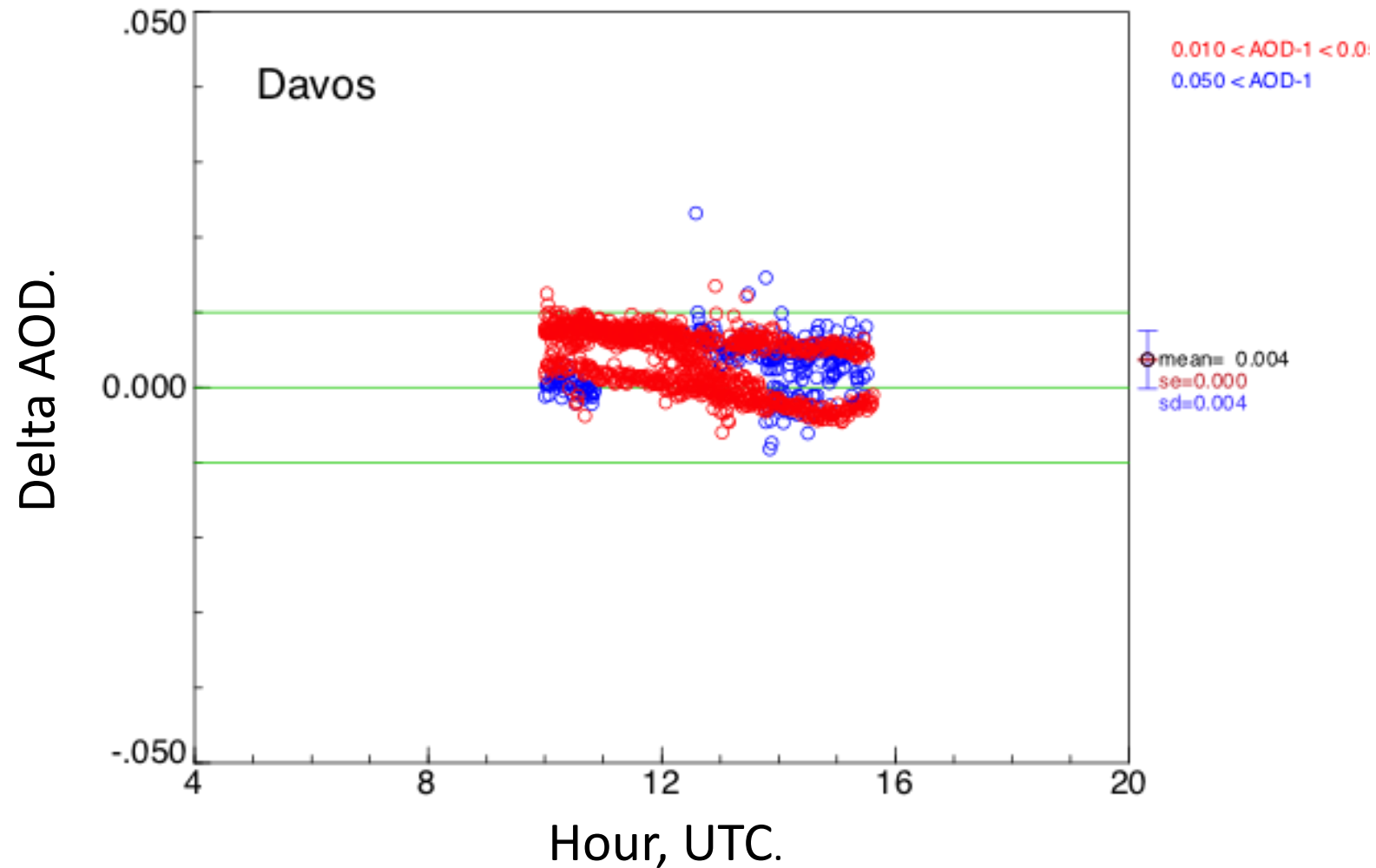
Effect of V0 offset on mean AOD
Solar Zenith Angle Range, during FRC-IV



Stderr = F(stddev, npoints)

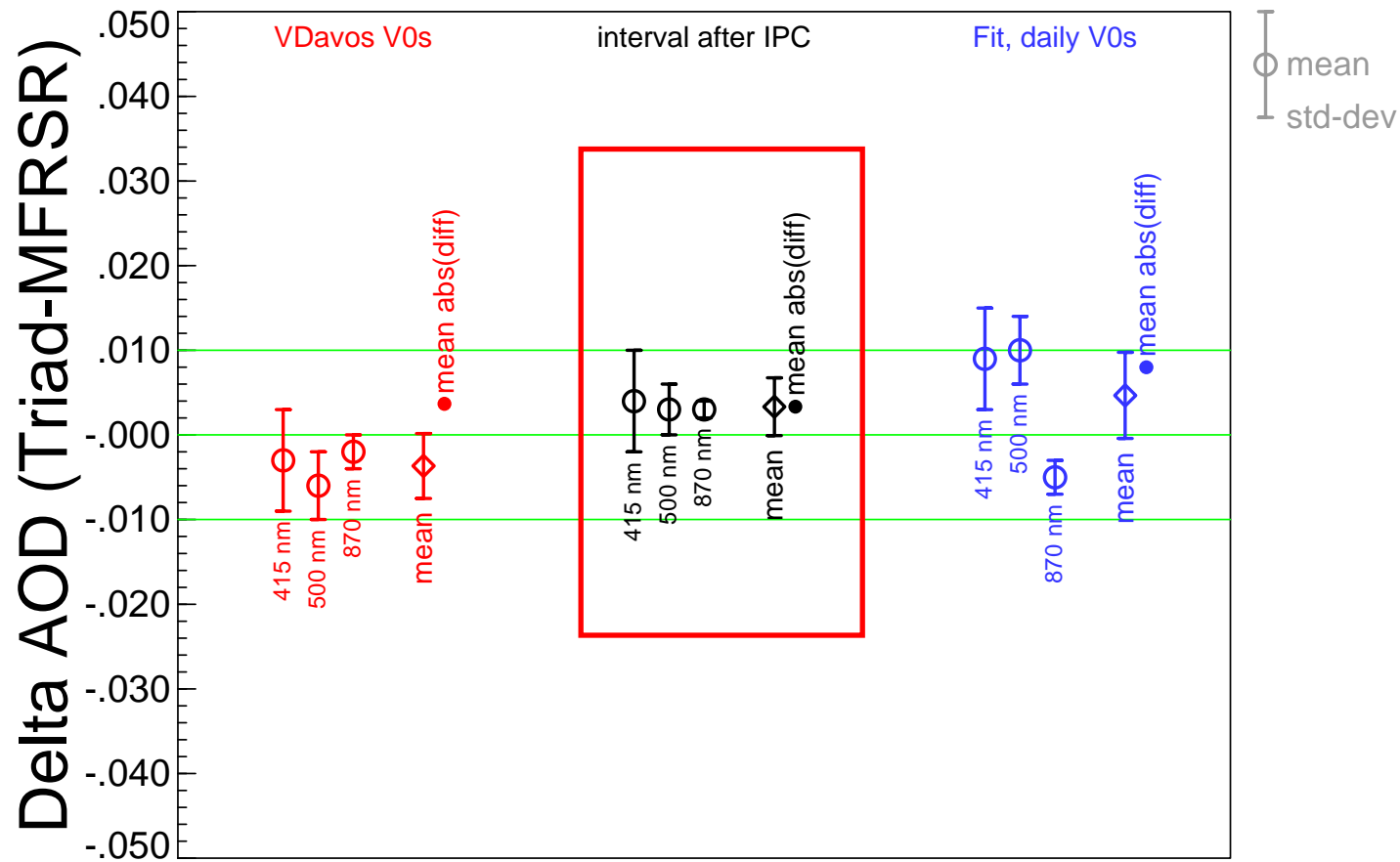


AOD differences Davos PFR Triad minus MFRSR.
MFRSR VOs based on three months after IPC.



AOD Differences PMOD-PFR-Triad - MFRSR-550

Data Taken in Davos during FRC-III Sept-Oct 2015
0.04 < AOD < 1.0 (2017-12-21 values)



Can VOs be determined in place?