OCO-2/3 Quarterly Calibration Update

OCO-TROPOMI-GOSAT Calibration Team Meeting #14 for GHG-AQ missions

Friday, September 12, 2025, 5:15-5:30 AM PDT

Robert Rosenberg for OCO Calibration Teams
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Jet Propulsion Laboratory
California Institute of Technology

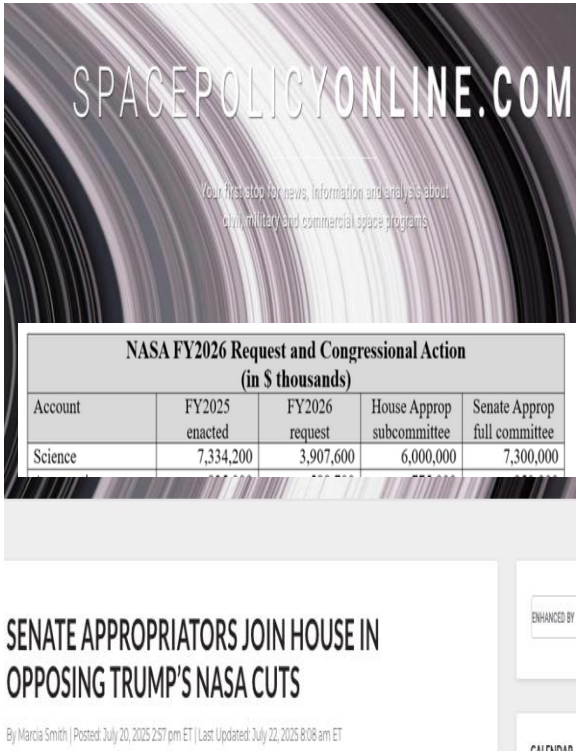
Outline

- Programmatic Updates
- Science Team Meeting
- Mission Operations
- Radiometric Trends
- Lunar Calibration
- Vicarious Calibration and BRF Validation
- October RRV Campaign

Programmatic Updates

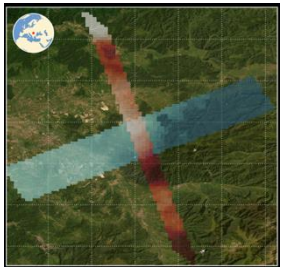
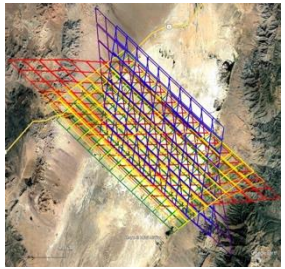
- 2 missions in active operation
- Appropriation, CR, partners, and closeout all possible
- Exploring RRV future (MAIA & beyond)
- STM Sep 23-26, Fort Collins

Jul 19



Calibration Breakout Tuesday September 16, 8a-10a PST



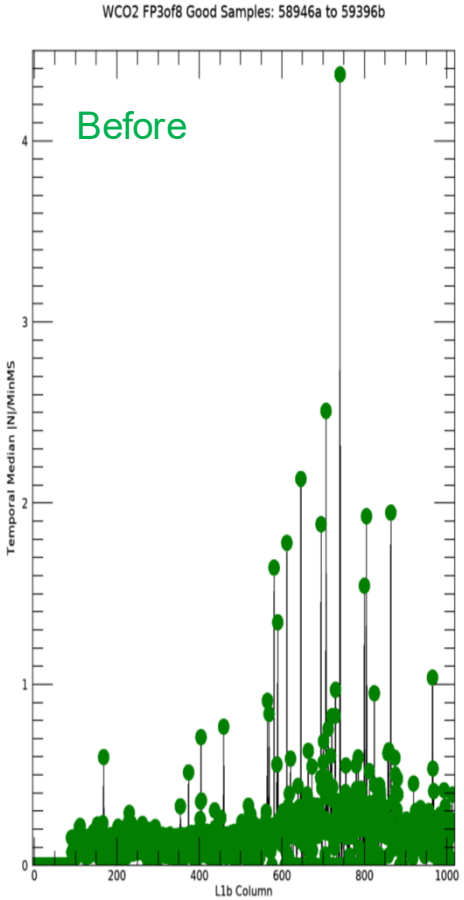



Contact RR or GK for invite!

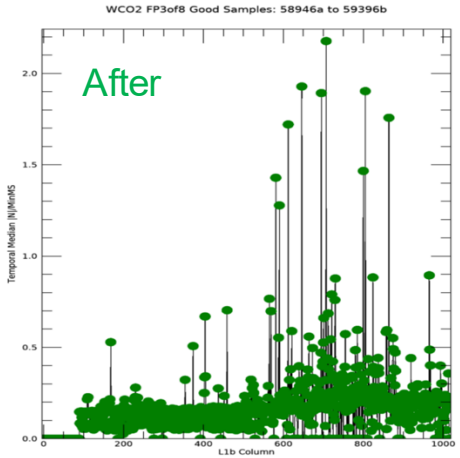
Speaker	Topic	AM PDT
	Welcome	8:00
Payne	Project Remarks	8:05
Rosenberg	OCO-2 Versions 11 and 12	8:10
Adumitroaie	Assessing OCO-2 Instrument Degradation with Lunar Calibration: An Eleven-Year Analysis	8:25
Fu	Vicarious Calibration of OCO-2 and OCO-3 Instruments Using Measurements at Railroad Valley, NV, USA	8:35
	Break	8:50
Kurosu	A Case of Rashomon Effect? Cross-Sensor Radiance Comparisons Using Near-Simultaneous Nadir Observations of OCO-2&3	9:00
Sarkissian	BRDF Validation for Vicarious Calibration Using Resampled OCO-2/3 Radiance and Geometry Data	9:15
Keller	OCO-3 B11 Calibration Status	9:25
	Discussion	9:45

OCO-2 Mission Operations

- Instrument & S/C healthy!
- Last decon Feb 2025, next NLT Feb 2027
  - Frequent better for ABO2 icing, worse for WCO2 bad pixels
- Rejected more WCO2 outliers before releasing August r02 coefficients

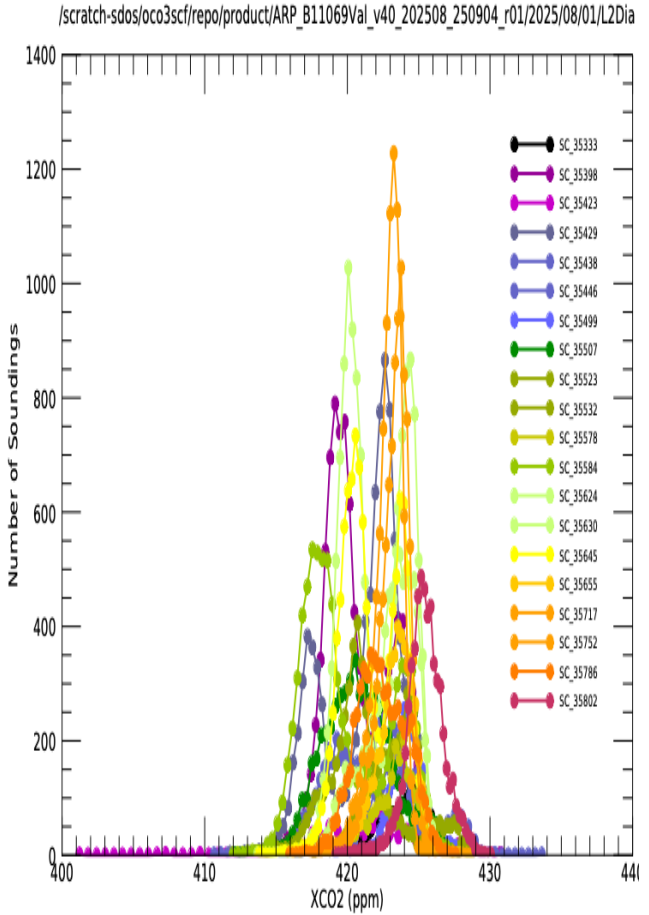


Median absolute value of of 287 Level 1B dark files: should be 0 + noise



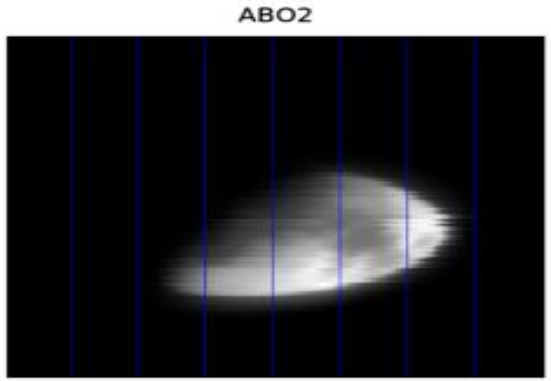
OCO-3 Mission Operations

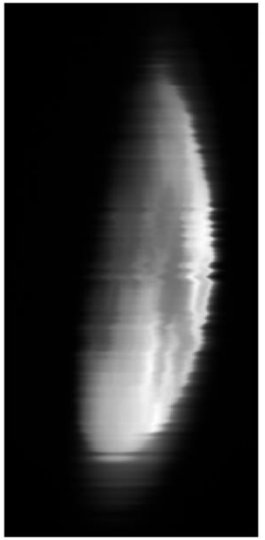
- Instrument & payload healthy!
- Last decon May 12-17, next Sep 22-26 pending RRV target opportunities
- Evaluating lunar cal Sep 16, subject to safety considerations
- Next lunar opportunity Oct 7-9 (coincident with RRV campaign)
- Next RRV opportunity Sep 19, new simulations released weekly

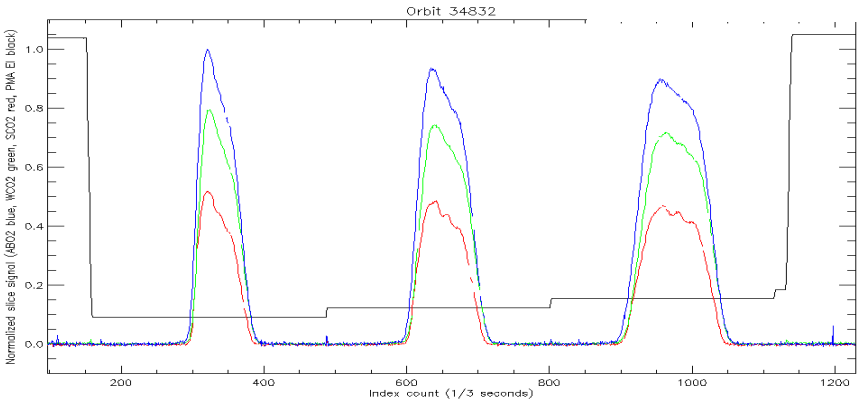


Lunar Calibration (V. Adumitroaie, V. Haemmerle)

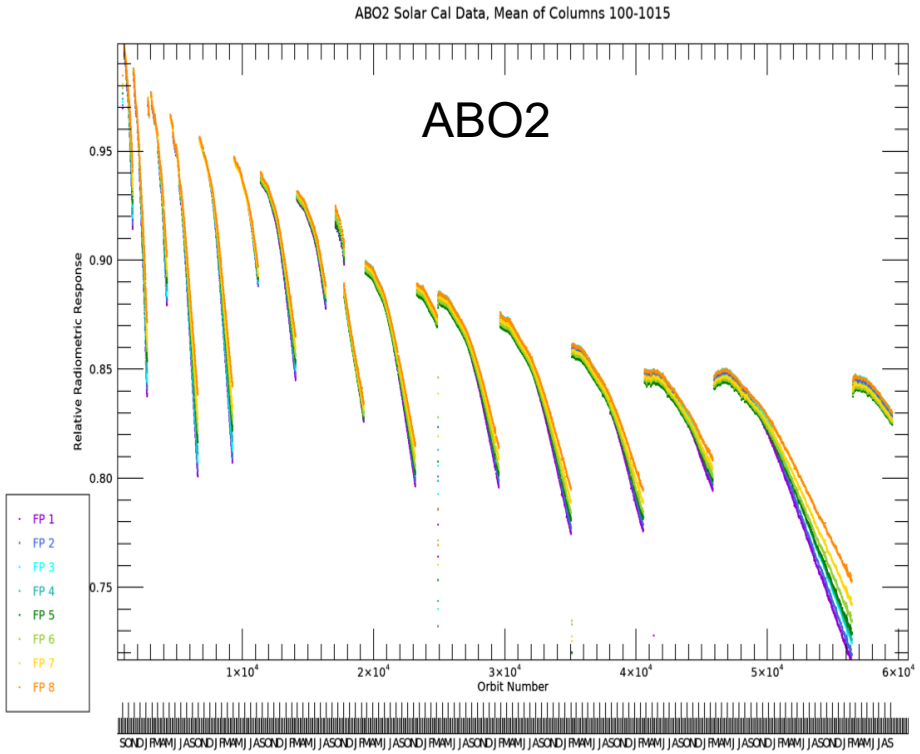
- Most recent OCO-3 June 29
  - Only up to 21% illuminated
- Most recent OCO-2 Sep 2 (2x)
  - Pixel mode: full spectral, full spatial, limited temporal
  - Science mode (footprints): full spectral, limited spatial, full temporal
  - Science mode (slices): limited spectral, full spatial, full temporal
- Looking to exploit simultaneous observations with the newly operational ARCSTONE cubesat

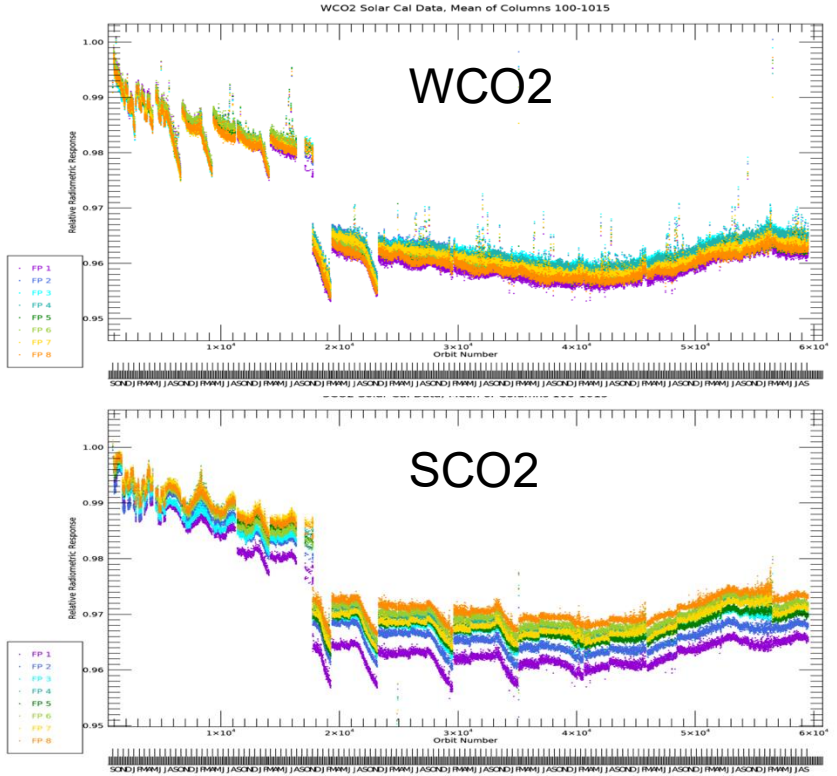




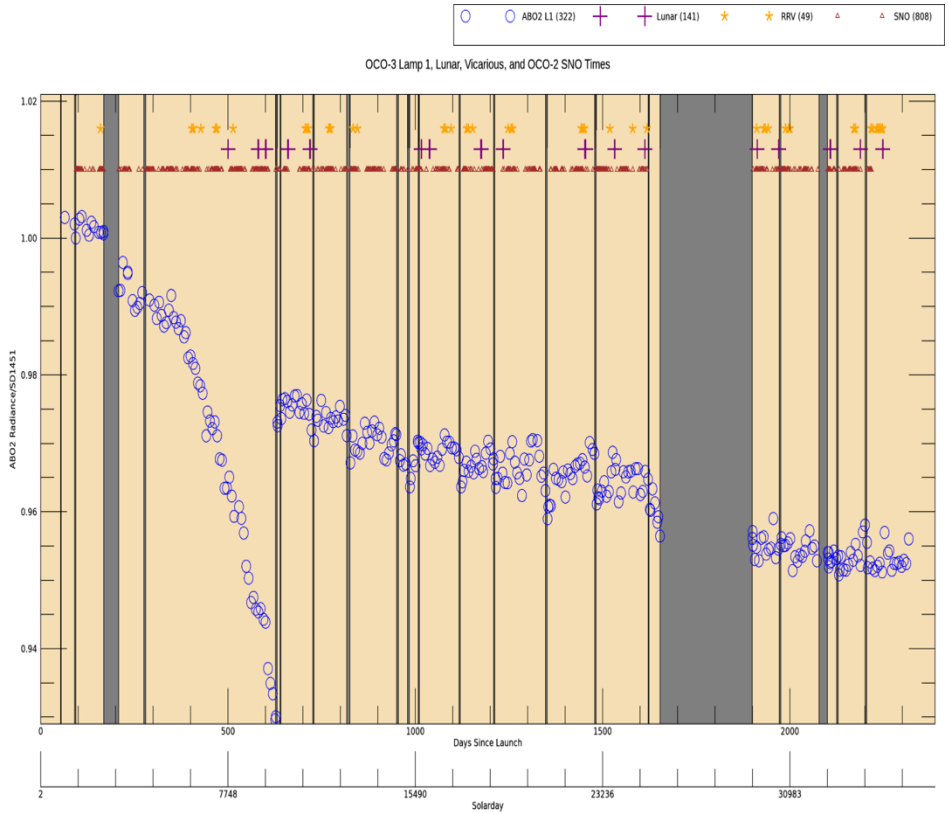


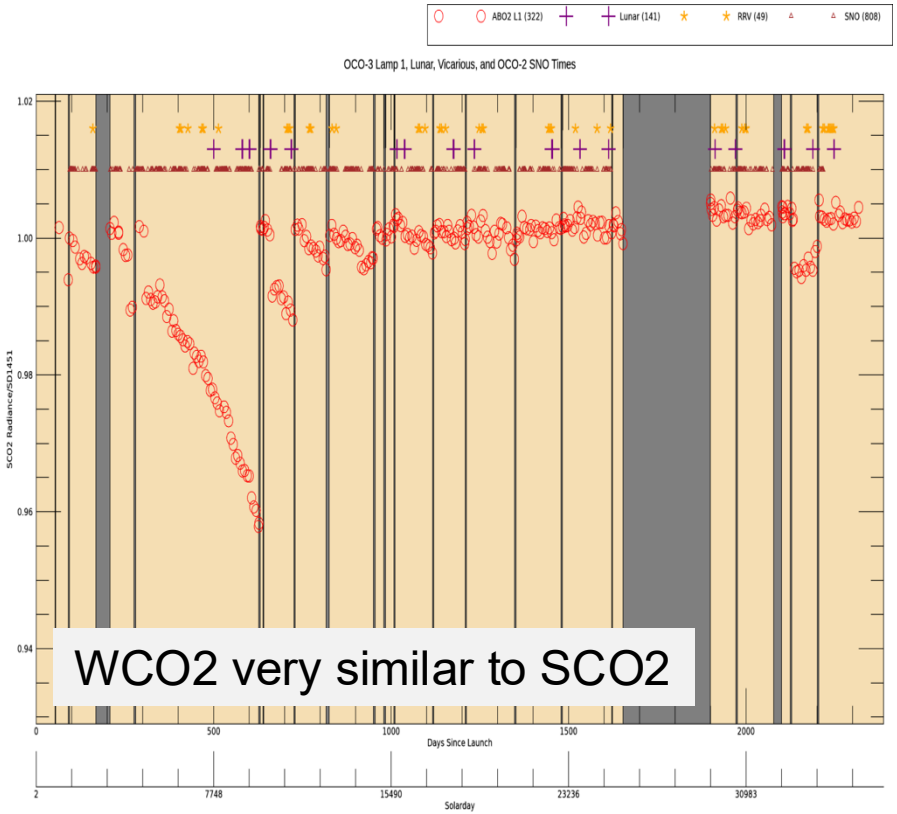
OCO-2 Solar Trend [Uncorrected] to Orbit 59532 (R. Lee)





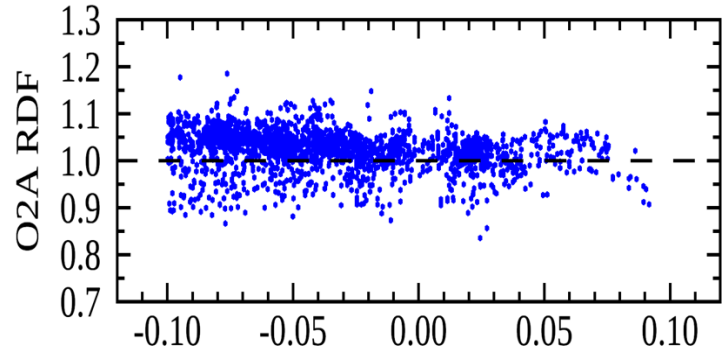
OCO-3 Lamp 1 Radiances & Calibration Times (G. Keller)



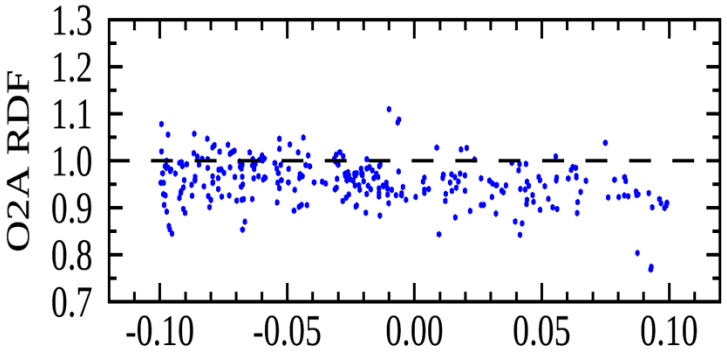


WCO2 very similar to SCO2

VicCal & MODIS nBRF (D. Fu)



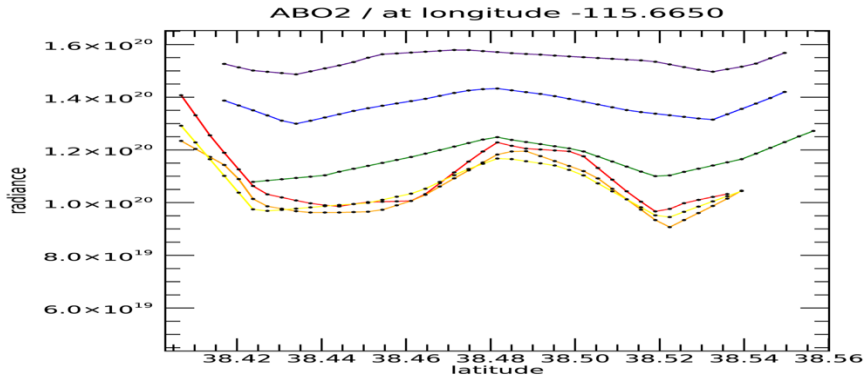
OCO-2 O2A RDF =
1.016 - 0.216 * (nBRF -1)
1.016 ± 0.001
-0.216 ± 0.021

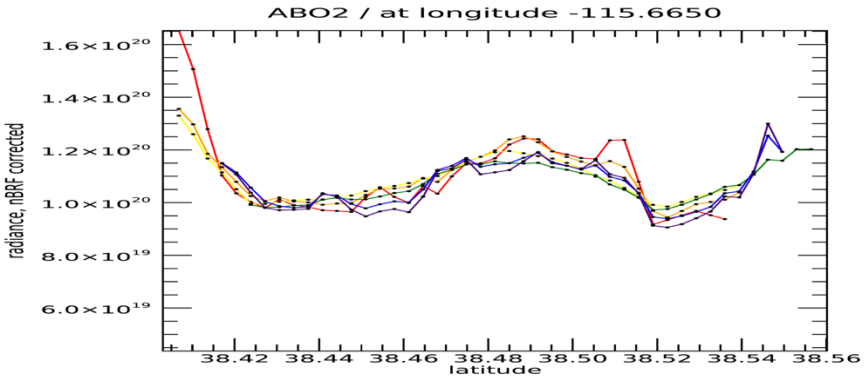


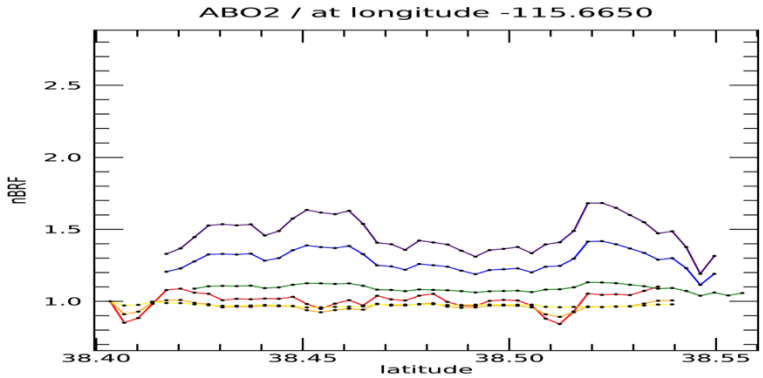
OCO-3 O2A RDF =
0.951 - 0.259 * (nBRF -1)
0.951 ± 0.003
-0.259 ± 0.048

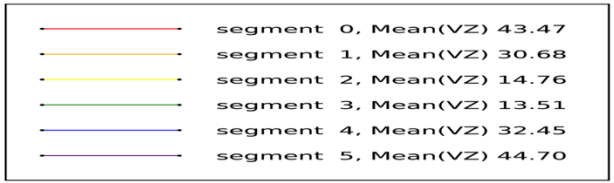
- Strongest in ABO2
- Ideally RDF and nBRF would have no correlation
- Behavior makes filtering even more important

BRF Correction on Resampled Grid (E. Sarkissian)









RRV Campaign (T. Pongetti)

- Excited to host GOSAT / GOSAT-2 / GOSAT-GW colleagues!
- On playa Oct 6-10
- Oct 7 most likely “golden day” but ISS changes frequently