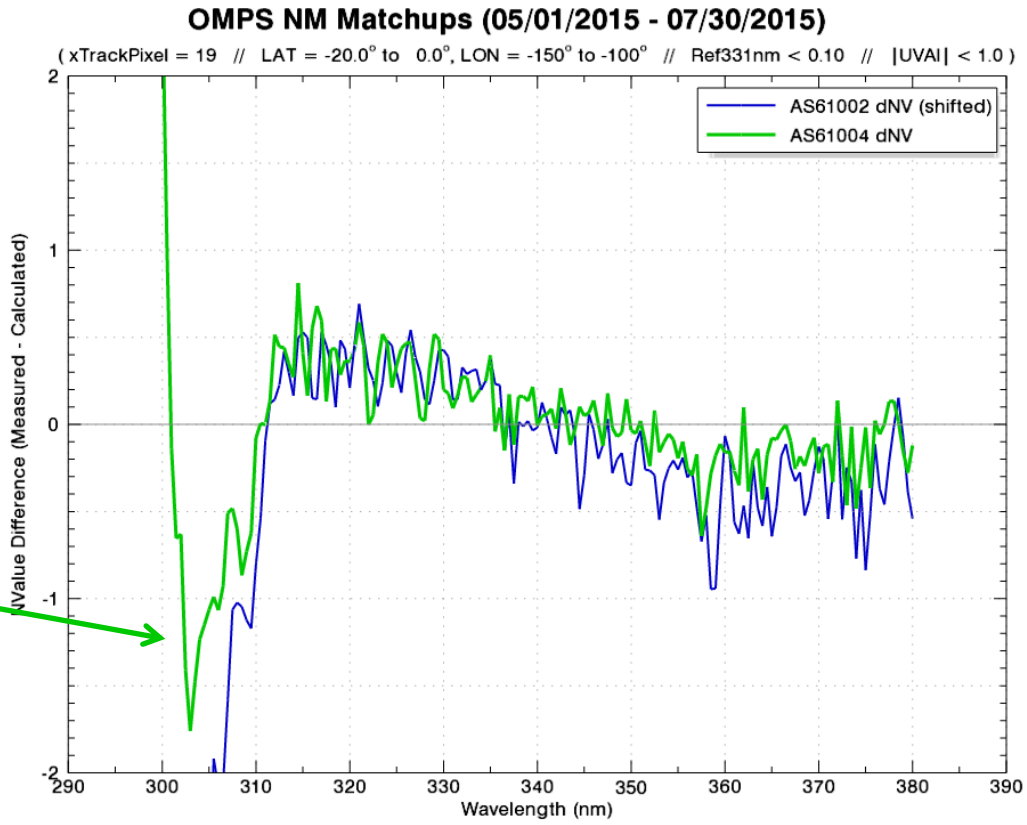
Results of the NASA Nadir OMPS V2 recalibration

Colin Seftor & The OMPS Core Team

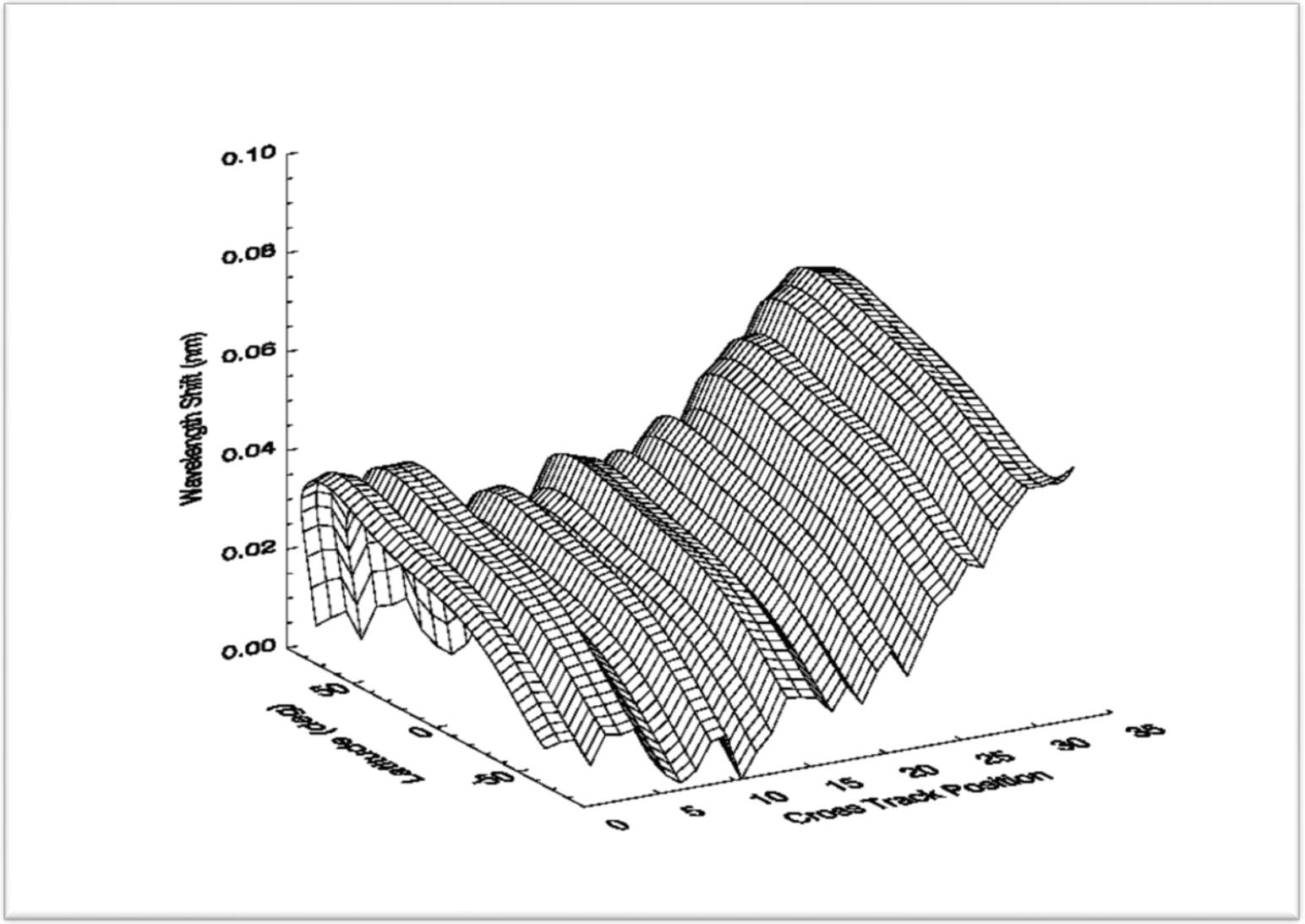
Changes in NASA V2 OMPS NM Radiances (L1B)

- Major differences between V1 dataset (available via ozoneaq*) and V2 dataset (available via ozoneaq* and the GES DISC) are
  - Intra-orbit wavelength shift accounted for
  - Far off-nadir wavelength registration (on the right side of swath)
  - Stray light correction (affects wavelengths < 310 nm)

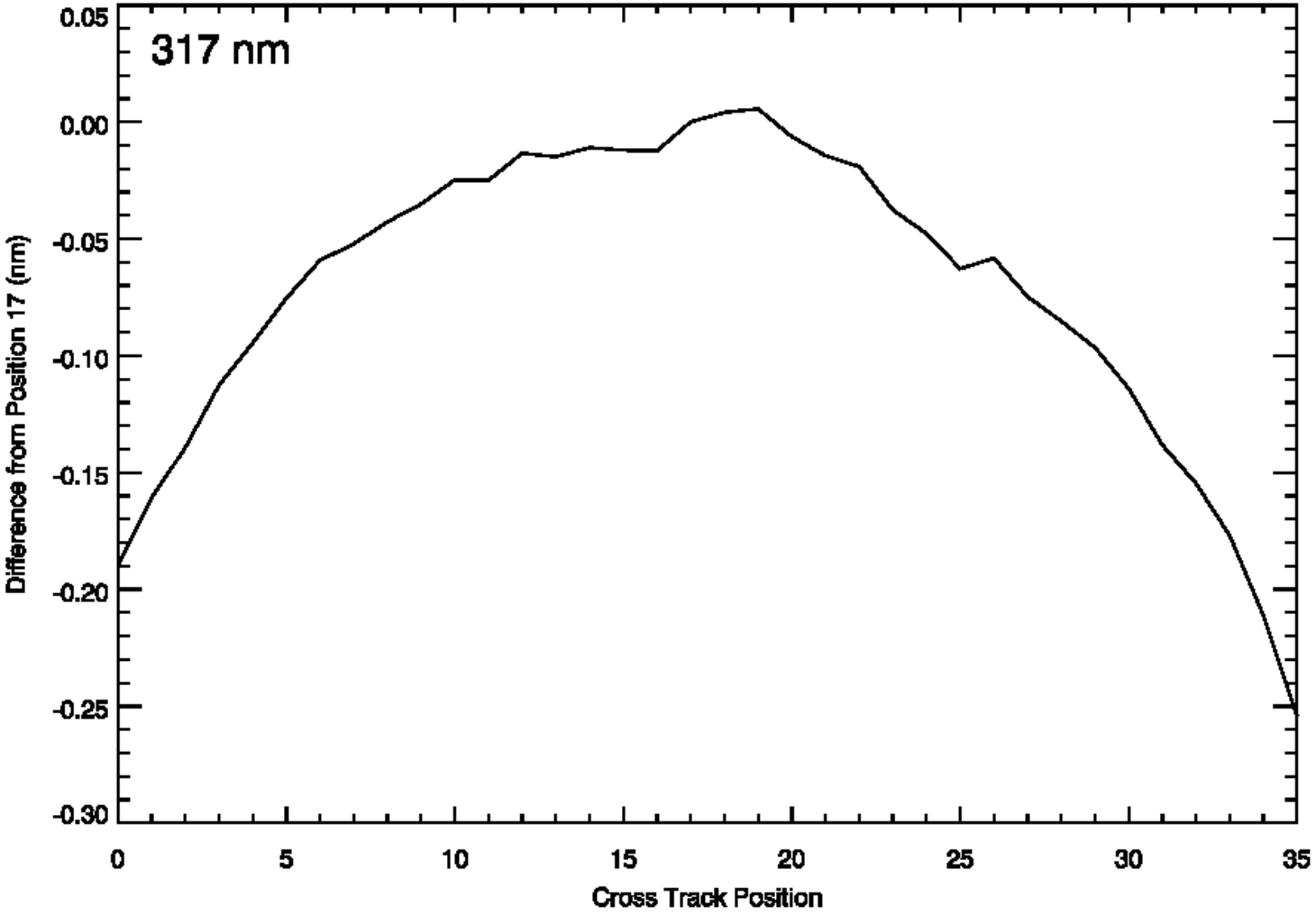


*https://ozoneaq.gsfc.nasa.gov/omps

Differences between Earth View and Solar Wavelengths Now Applied

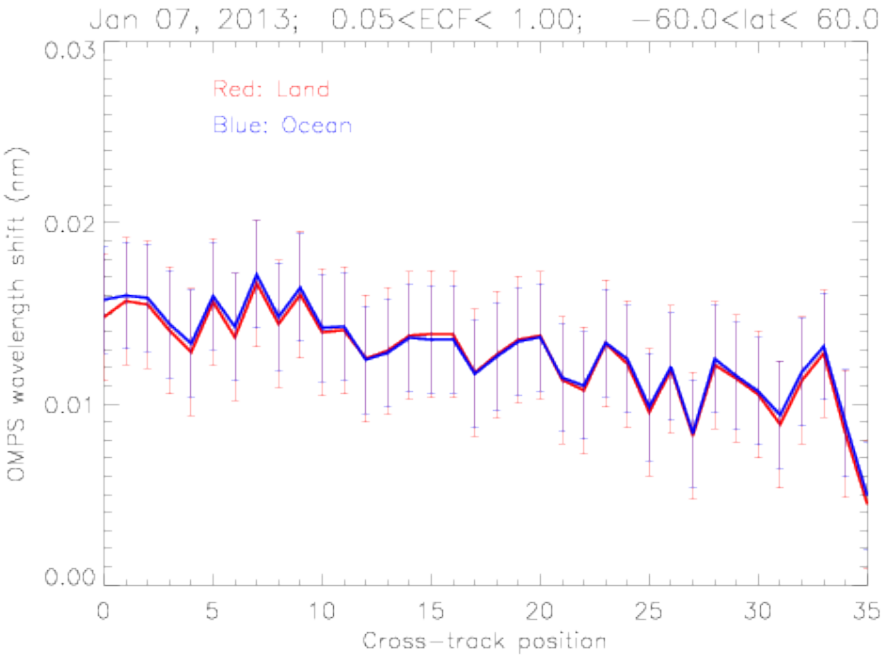


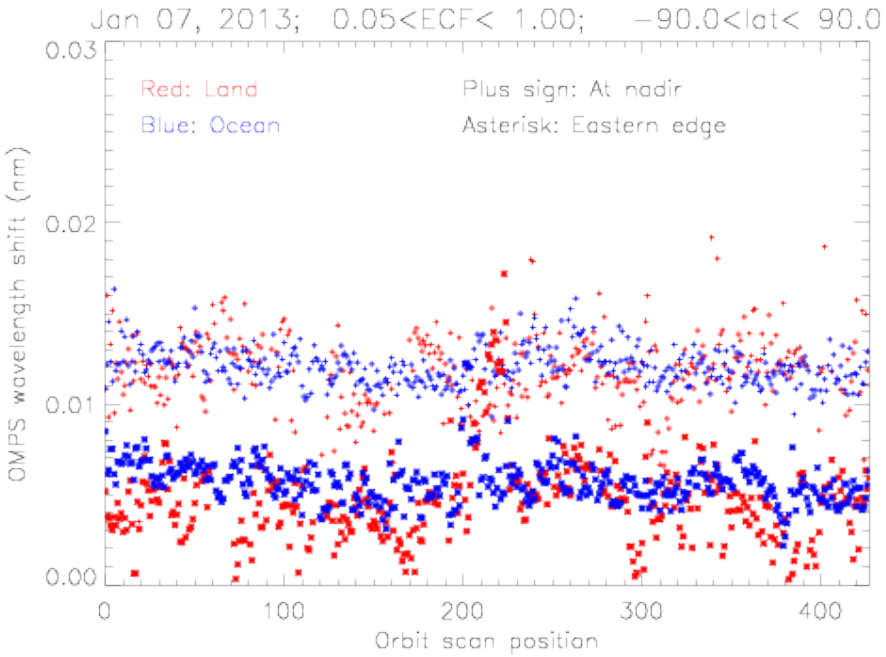
New Fit to “Spectral Smile” More Accurately Maps WL’s on Right Side



Wavelength shifts

The wavelength shifts are retrieved from the rotational-Raman scattering cloud algorithm





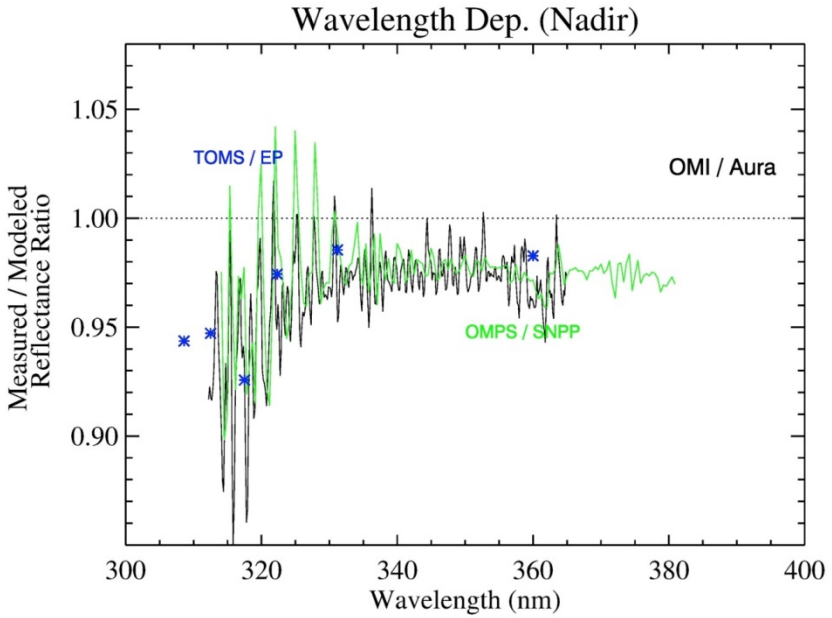
Wavelength shift as a function of OMPS cross-track position

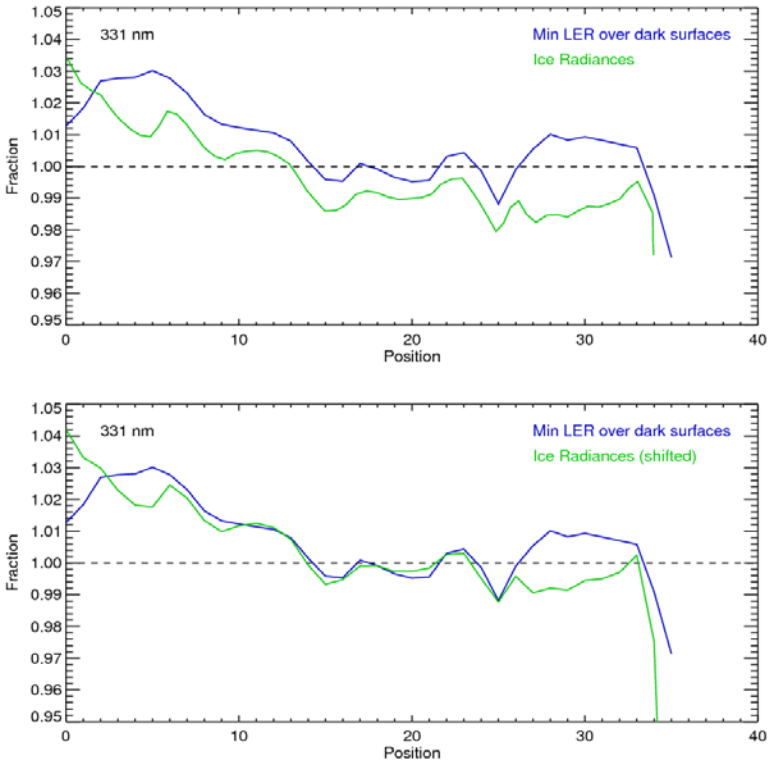
Wavelength shift as a function of OMPS orbit scan position

On average, the wavelength shifts are lower that those retrieved with old L1B data by a factor of 3.

OMPS NM Soft Calibration

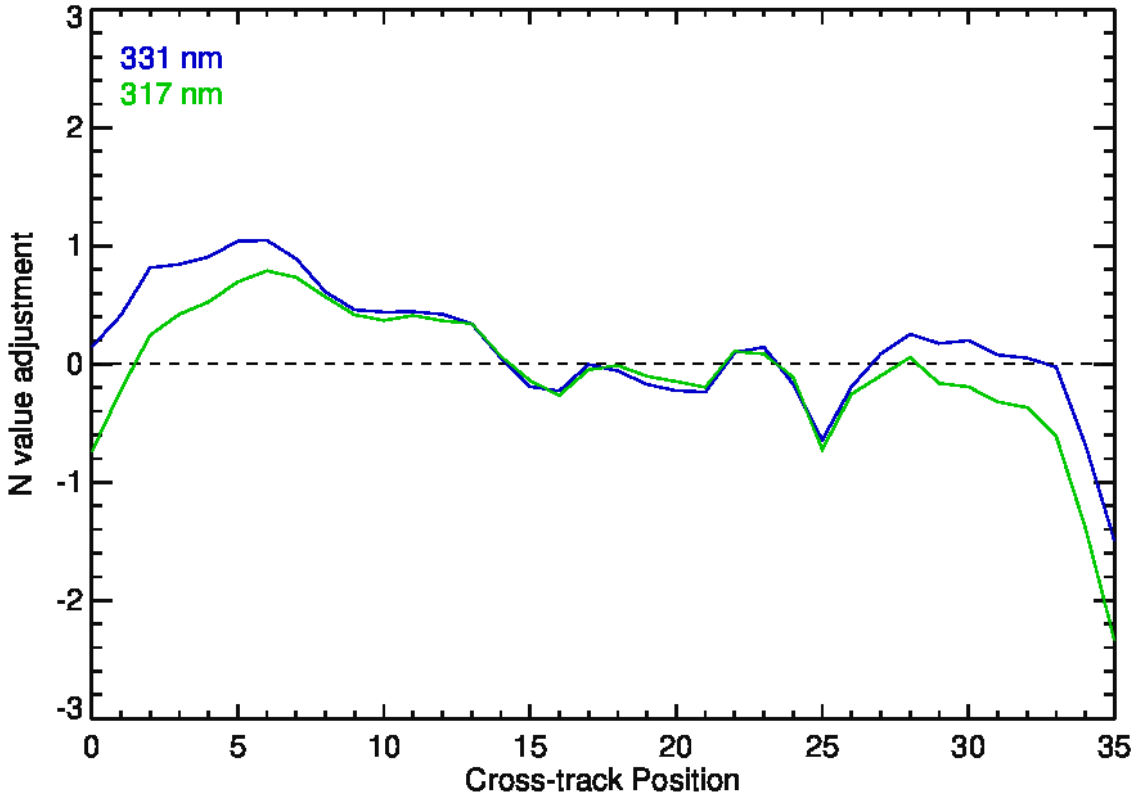
- Based on ice radiance analysis, we did not change the absolute nadir calibration of the 331 nm channel
  - OMPS, OMI (before adjustment) and EP TOMS all agree
  - Analysis using minimum reflectivity envelopes for dark land surfaces agrees with ice radiance to within 1%





OMPS NM Soft Calibration

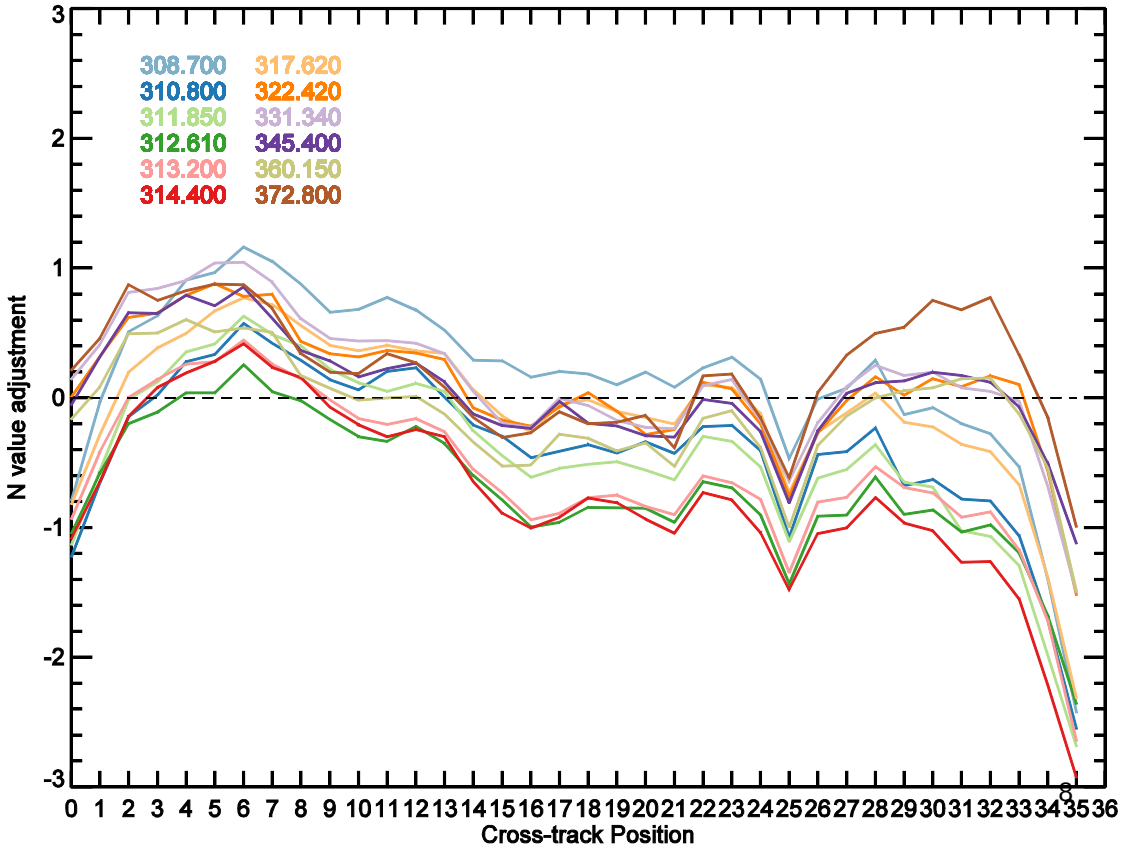
- Off-nadir adjustments of the 331 nm channel needed to take out reflectivity “striping”
  - Adjustments determined by land minimum reflectivity envelope (dark green vegetation)
- Absolute calibration of the 317 nm radiances in the nadir direction not changed
  - Off-nadir adjustments determined by “flattening out” ozone over the 4 degree wide equatorial Pacific Ocean (accounting for sun glint)



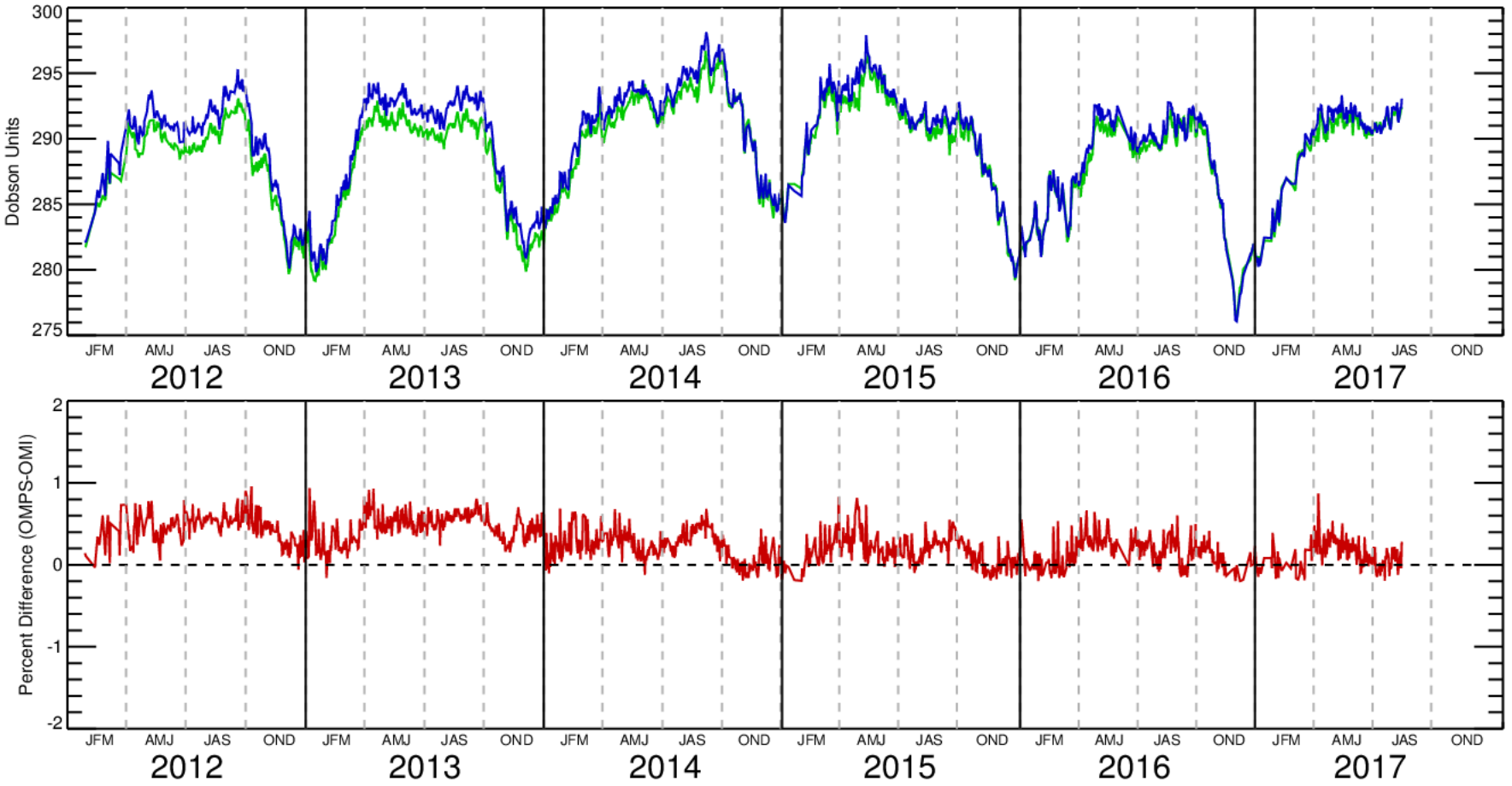
OMPS NM Soft Calibration

- Non ozone absorbing wavelength adjustments determined using ice reflectivities at nadir, minimum land surface reflectivity envelopes off-nadir
- Ozone absorbing wavelength adjustments determined by “zeroing out” (Step 2) retrieval residuals

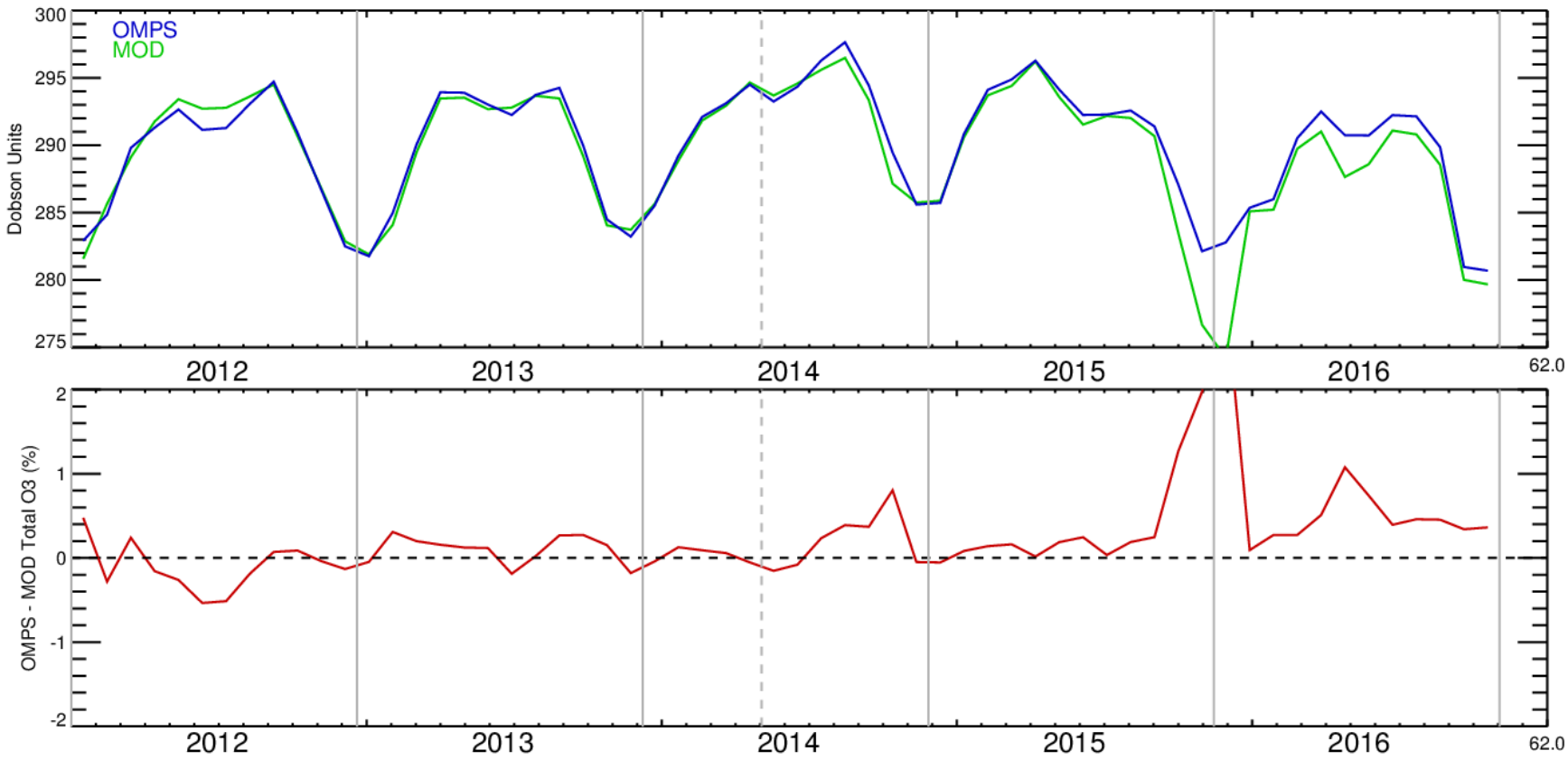
Ball’s specification for normalized radiances was 2%



OMPS NM Comparison to OMI data (60S to 60N)

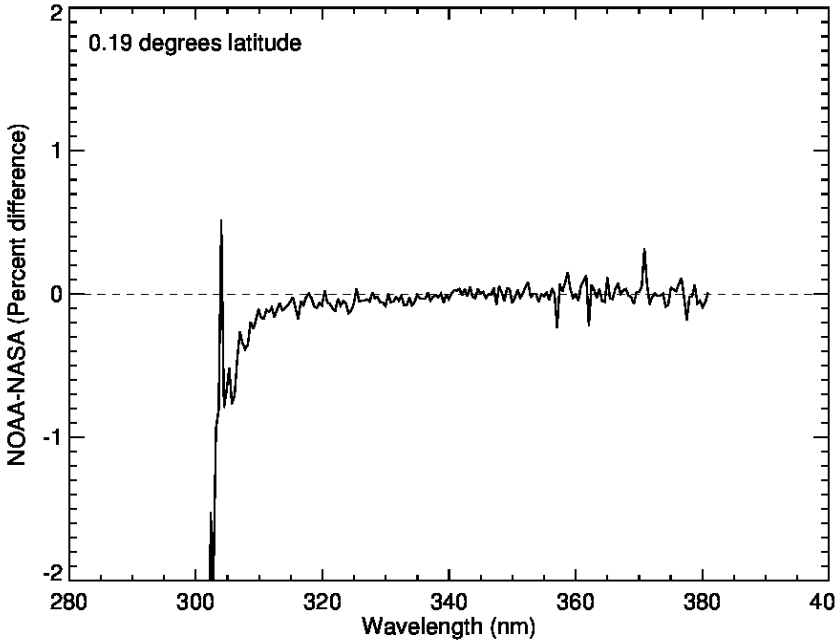


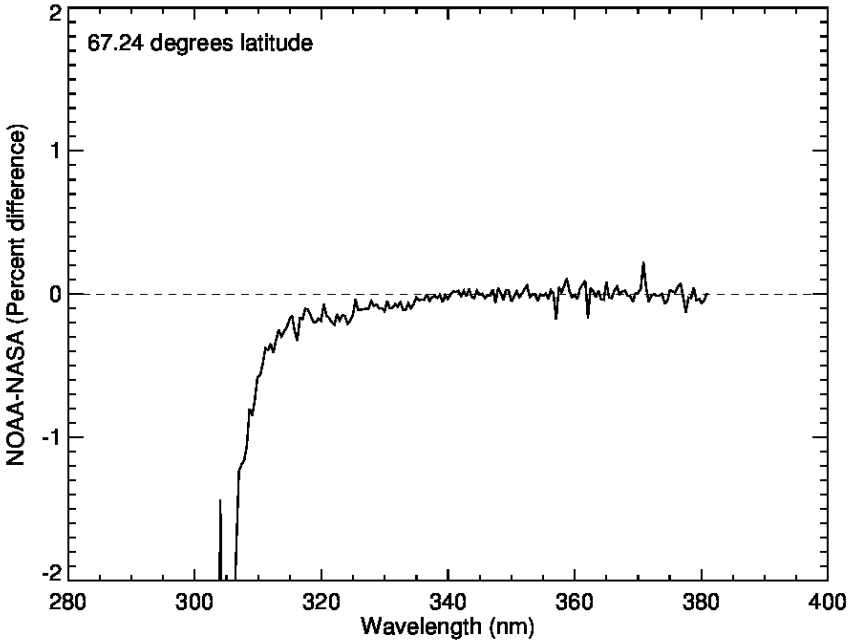
OMPS NM Comparison to MOD data (60S to 60N)



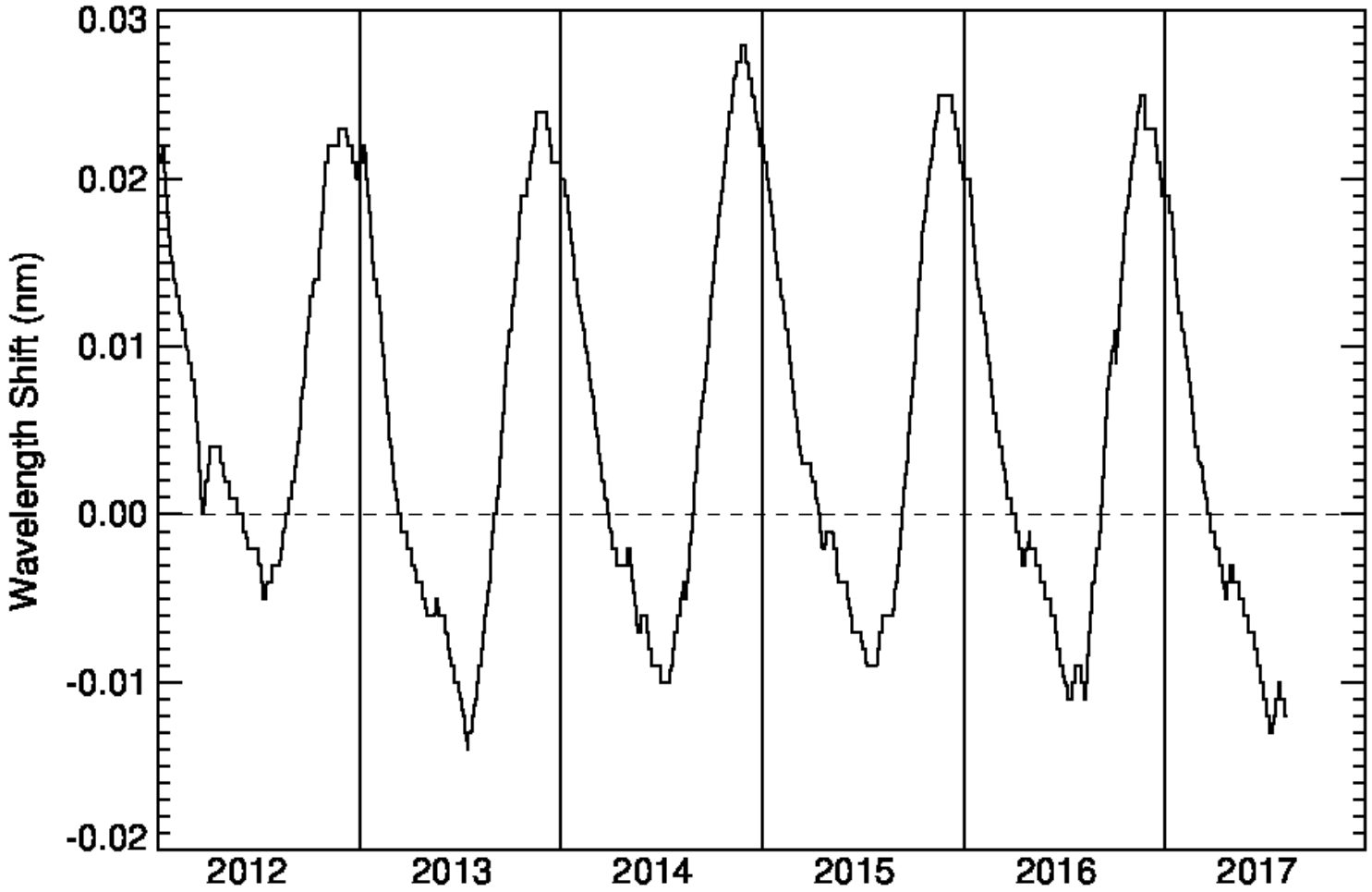
Radiances different between NOAA SDR, NASA L1B

Orbit 29822 – 30 July 2017



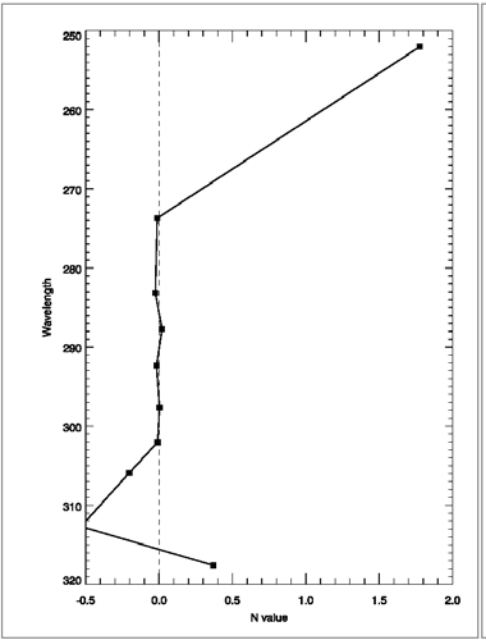


Time Dependence of NP Earth View Wavelengths Now Accounted For

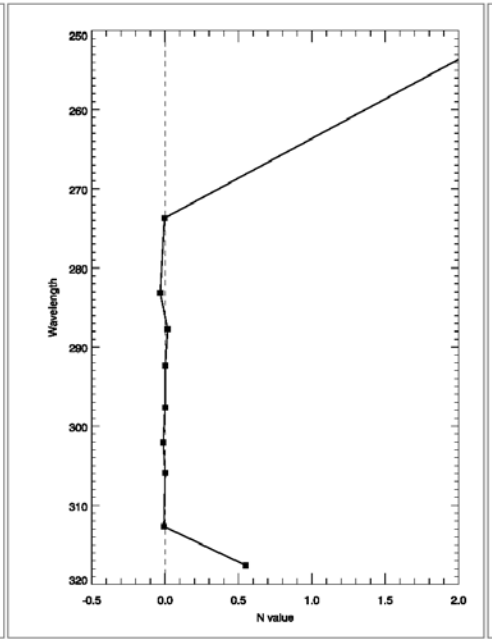


OMPS NP final residuals based on longest wavelength used

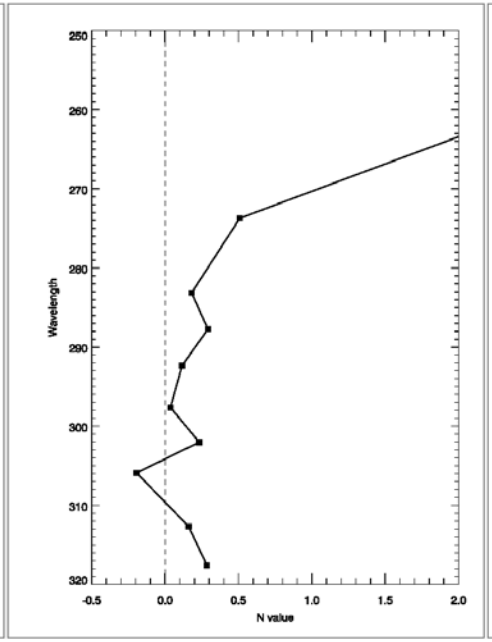
302 nm



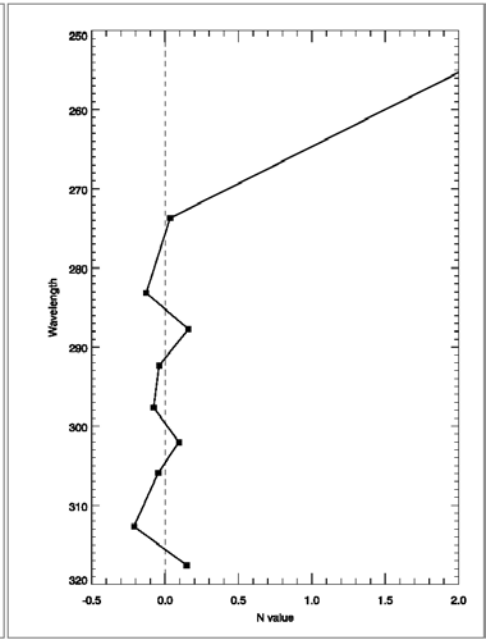
306 nm



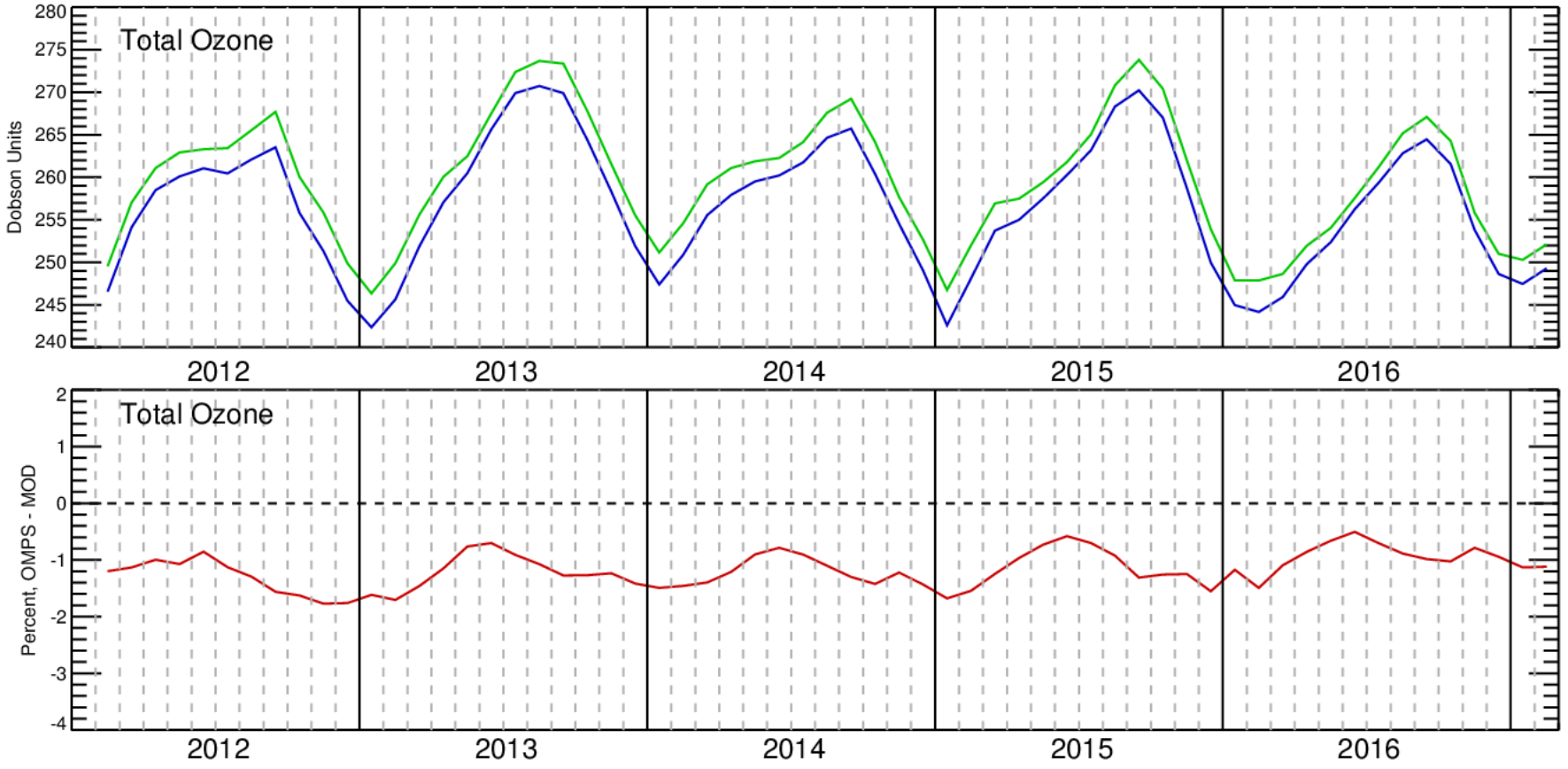
312 nm



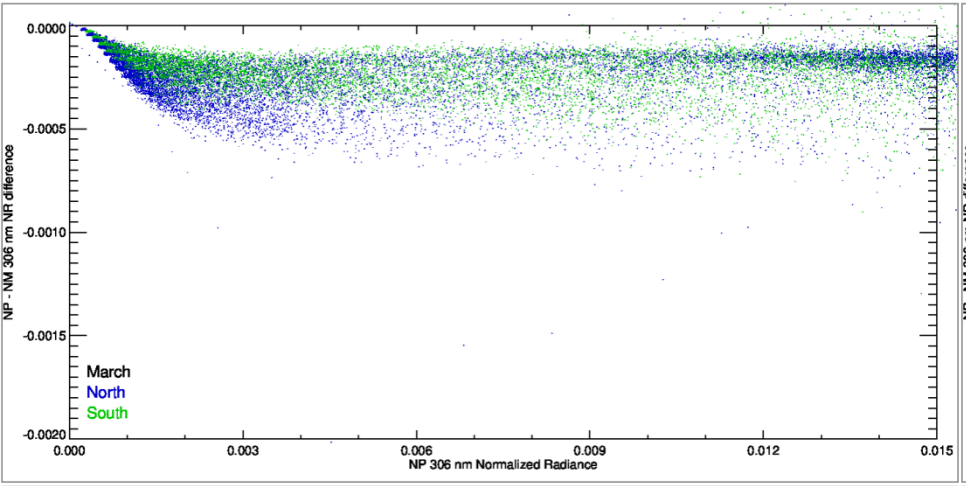
317 nm

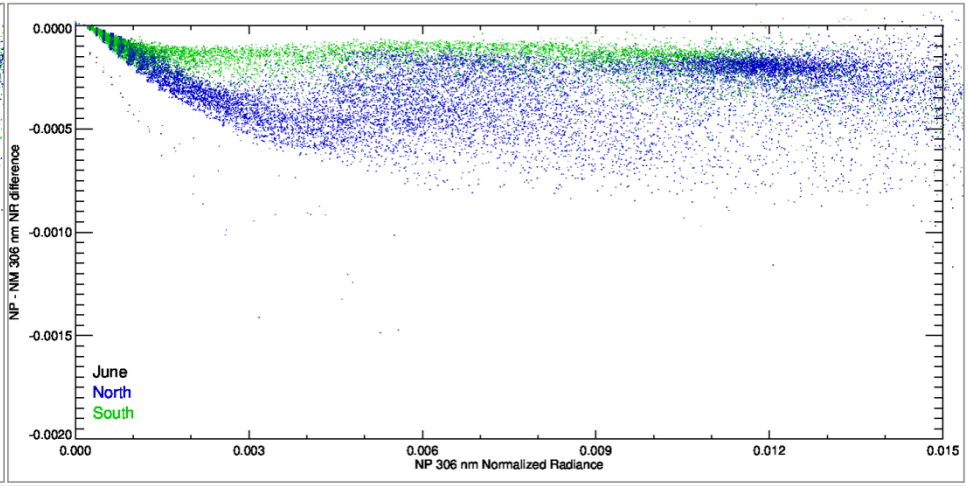


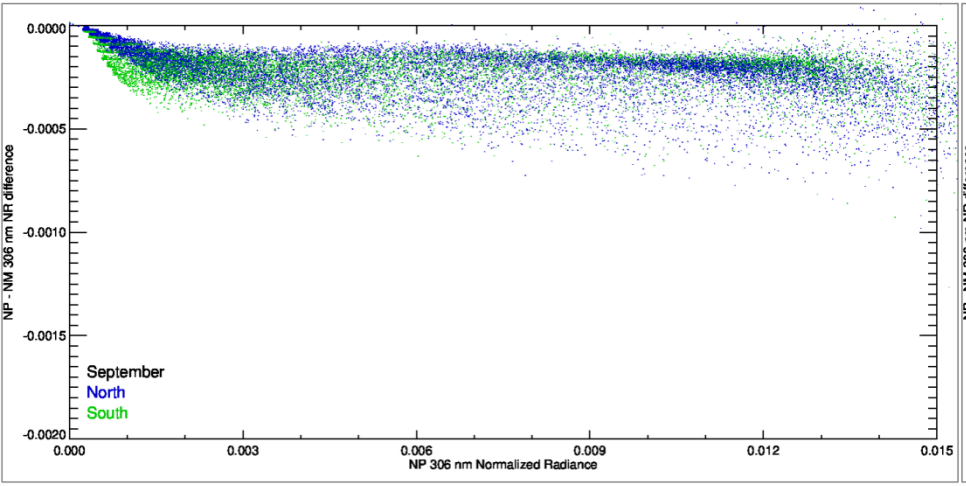
OMPS NP Comparison to MOD data (20S to 20N)

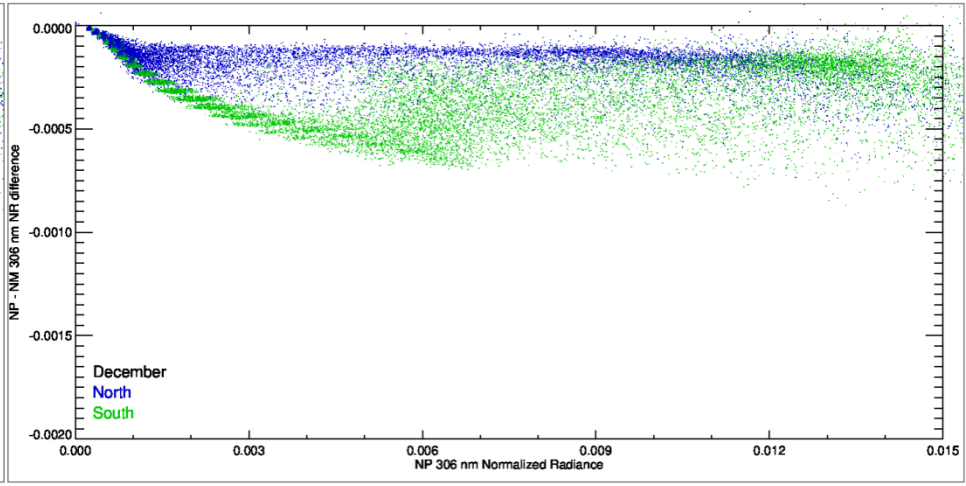


“Disconnect” Between NP and NM Radiances





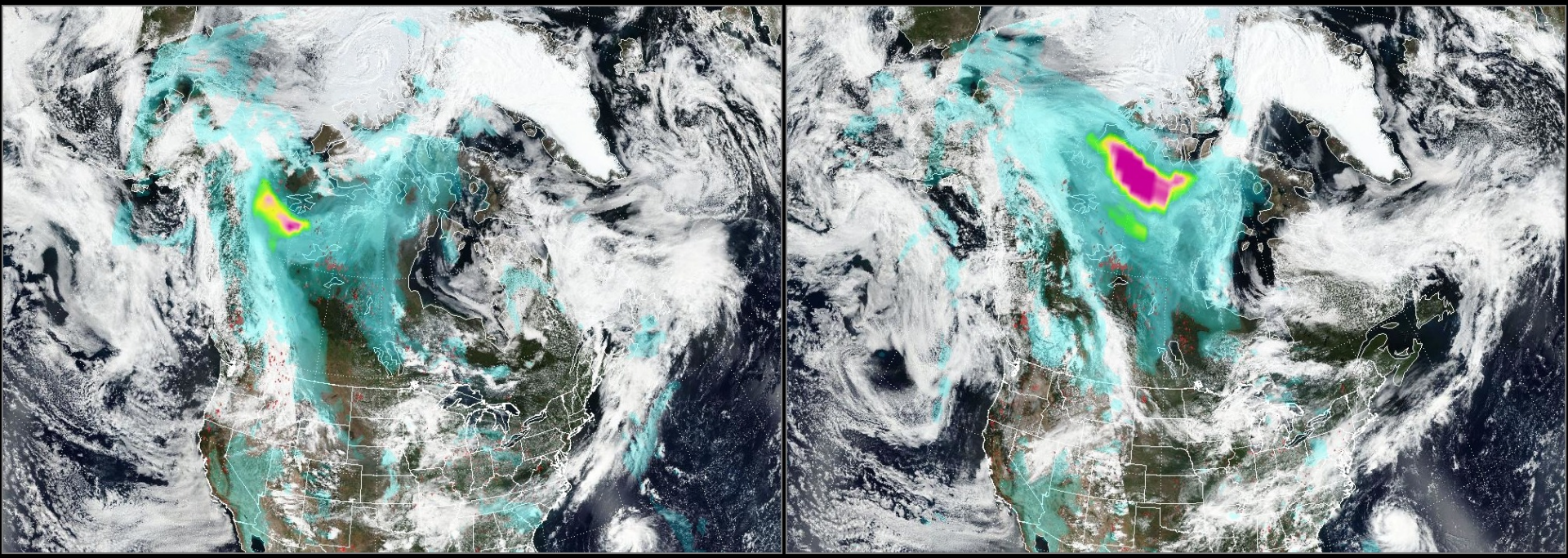




PyroCb Activity Over Canada Produced Highest AI Value Ever Recorded

13 August 2017

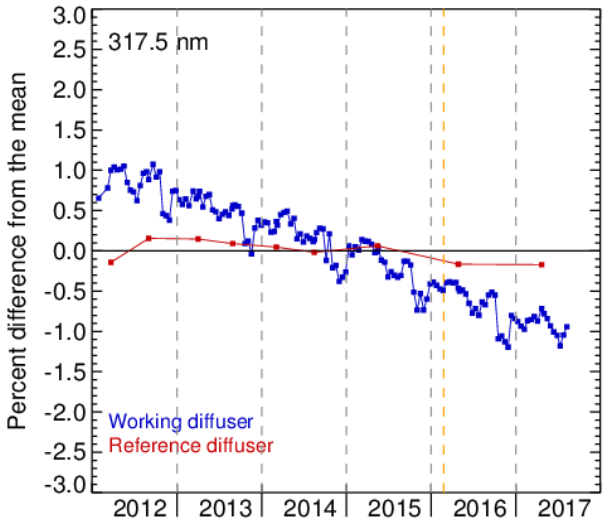
14 August 2017

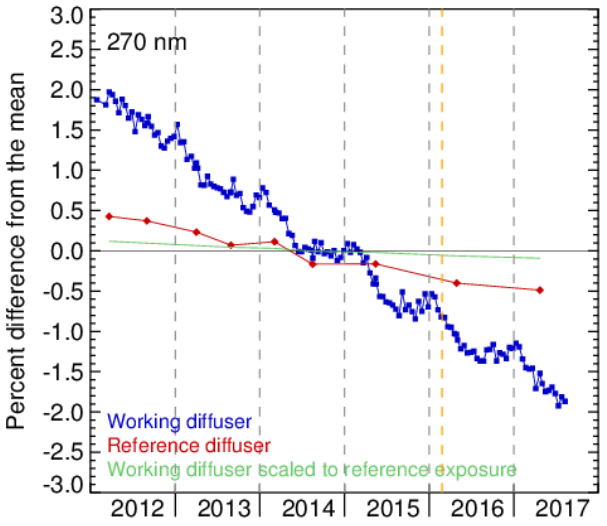


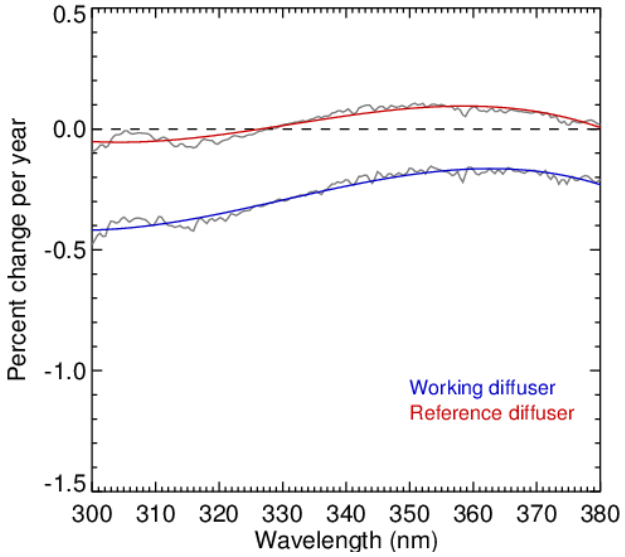
0 Aerosol Index 40

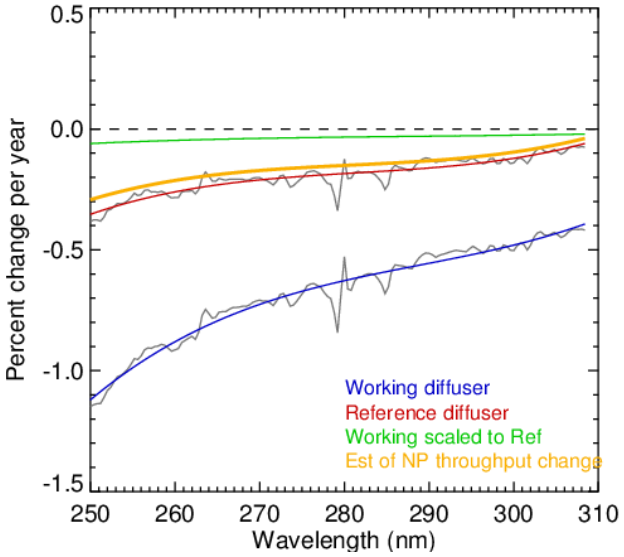
Backup

OMPS NM and NP Sensor Degradation is Negligible (NM) or Minimal (NP)

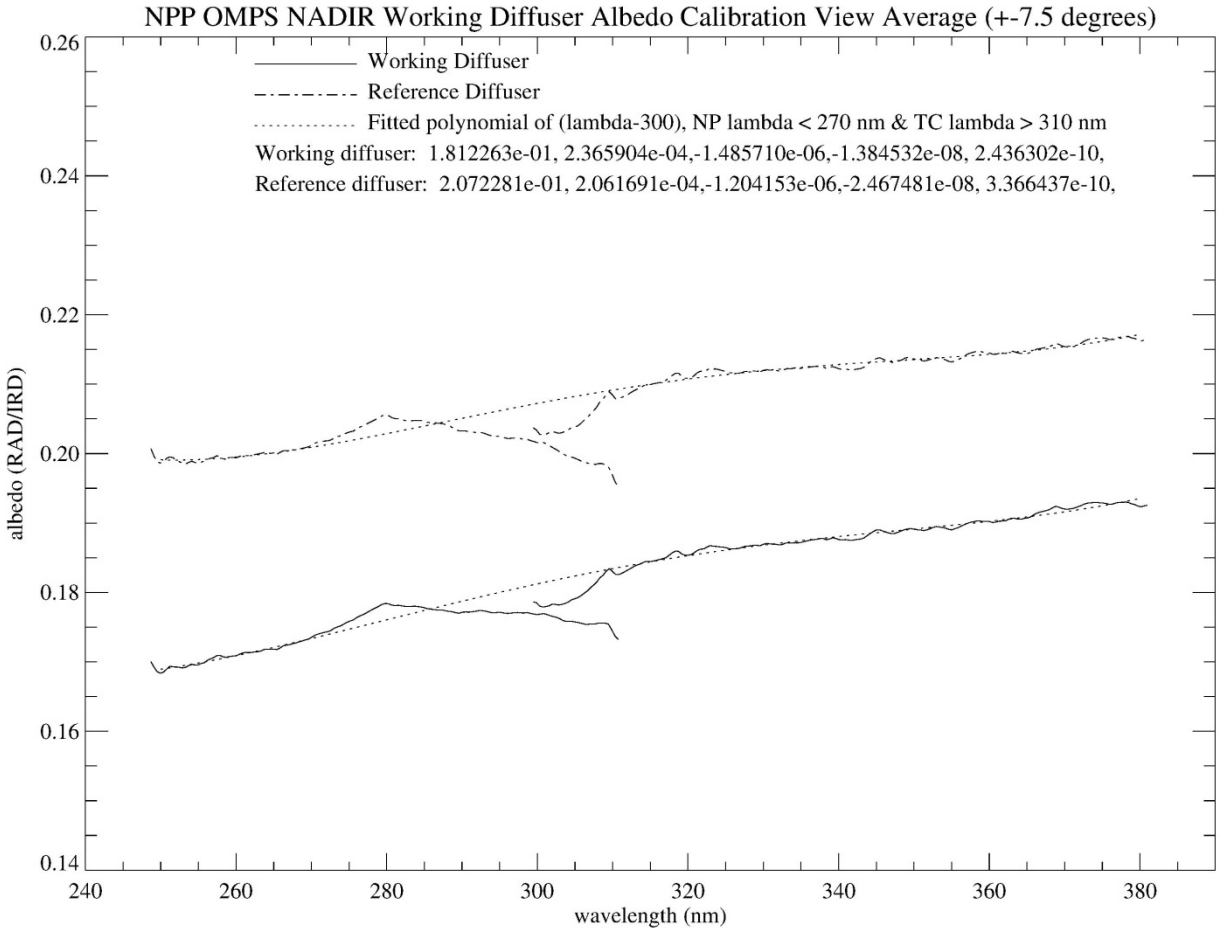






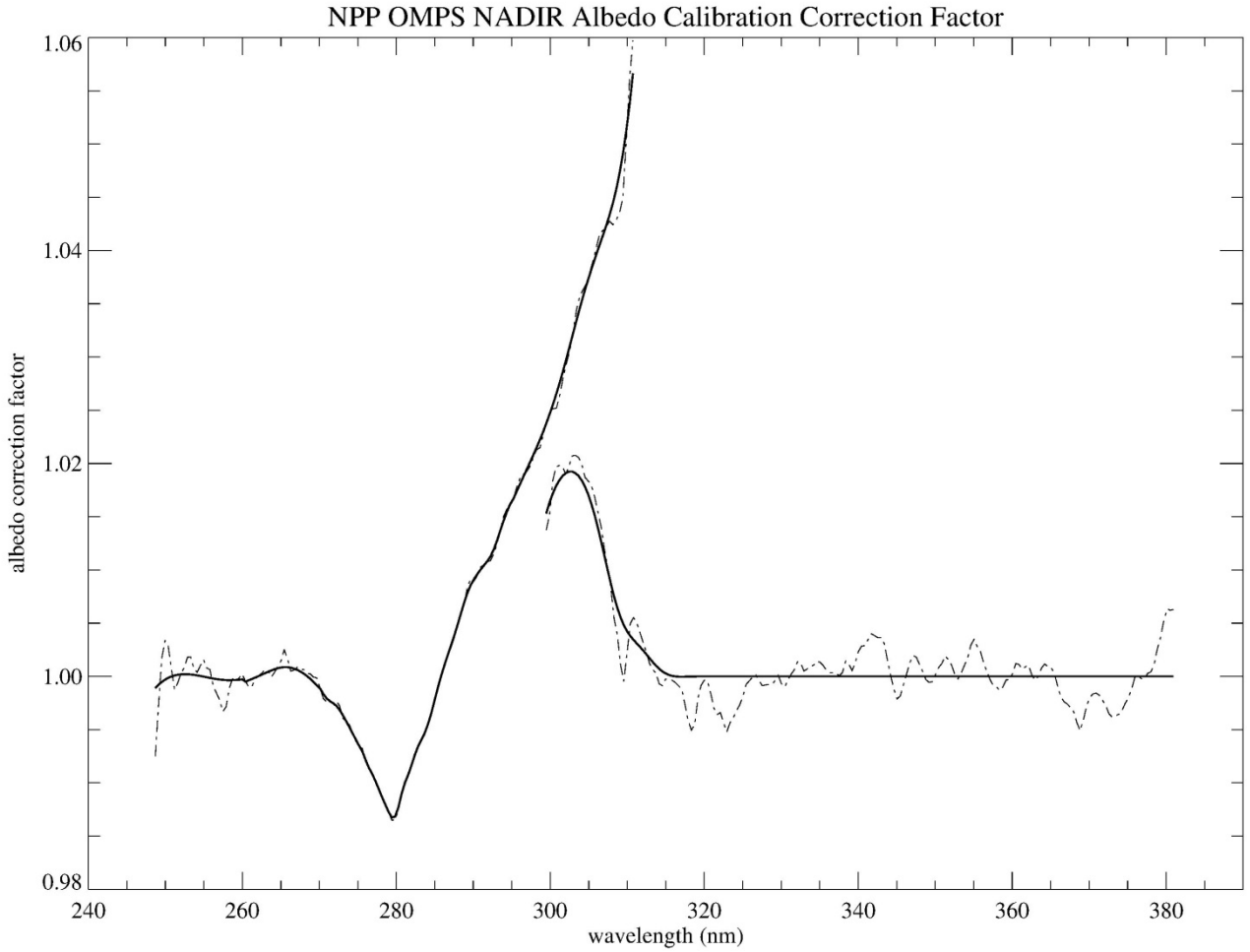


OMPS NM Radiances (L1B)



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OMPS NM Radiances (L1B)



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