OMPS Nadir Radiometric Calibration

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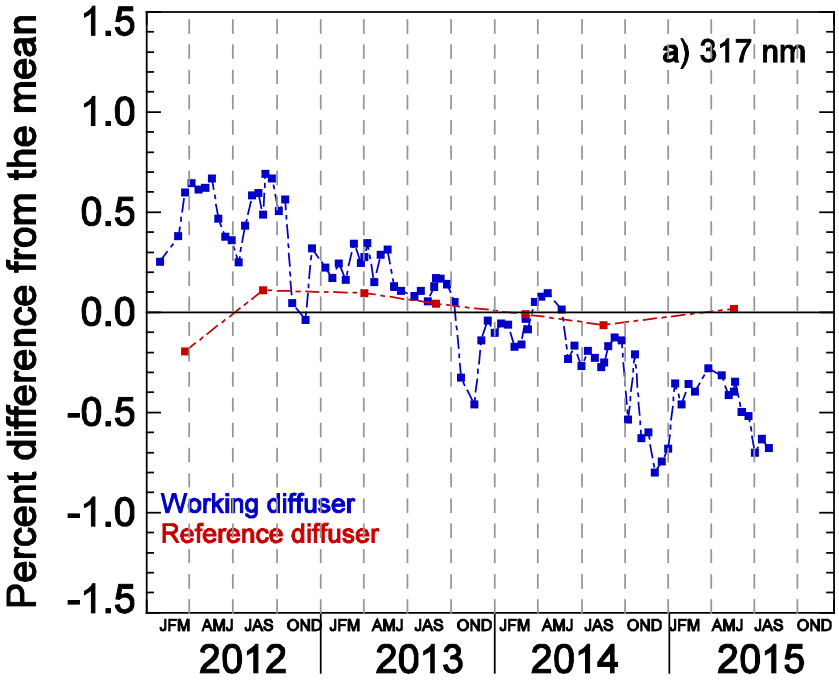
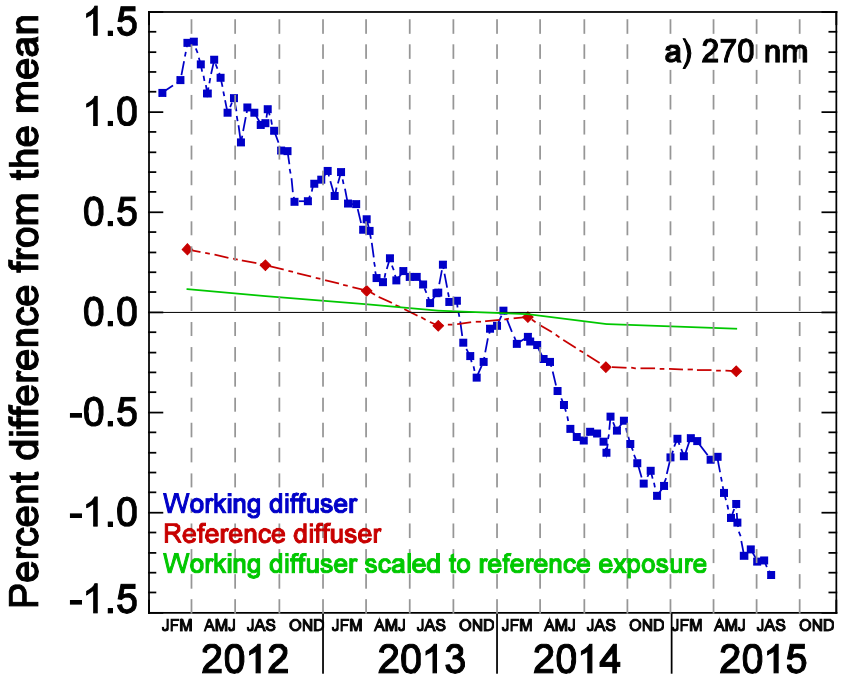
Both the NM and NP sensors are extremely stable





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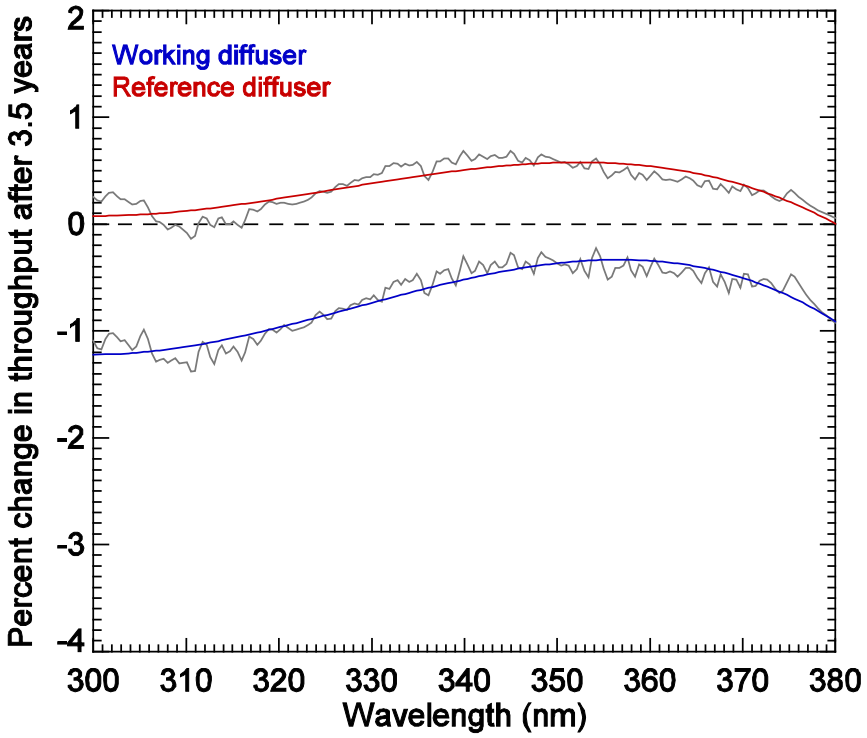
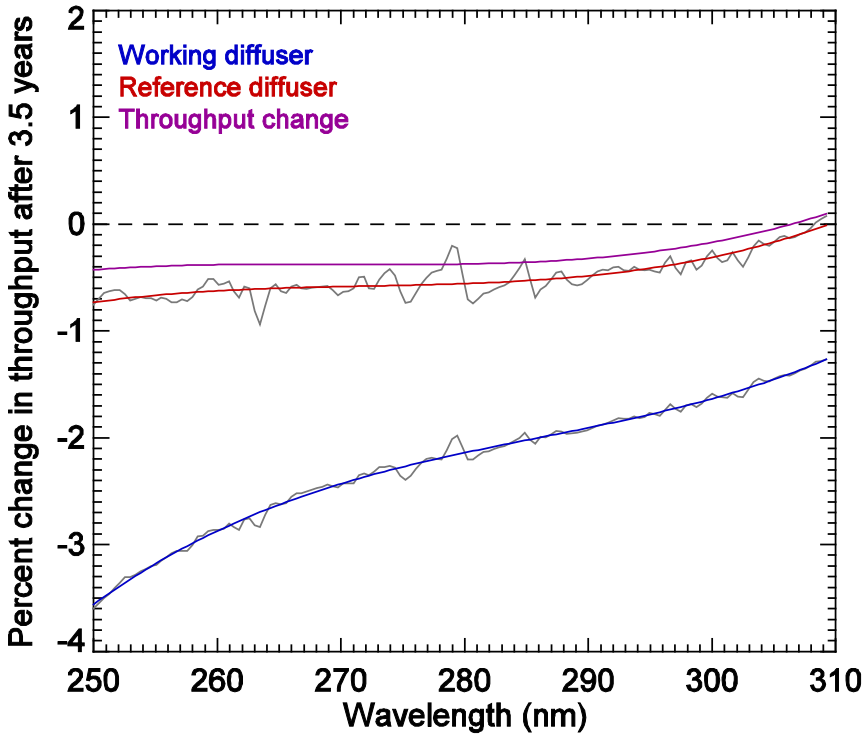
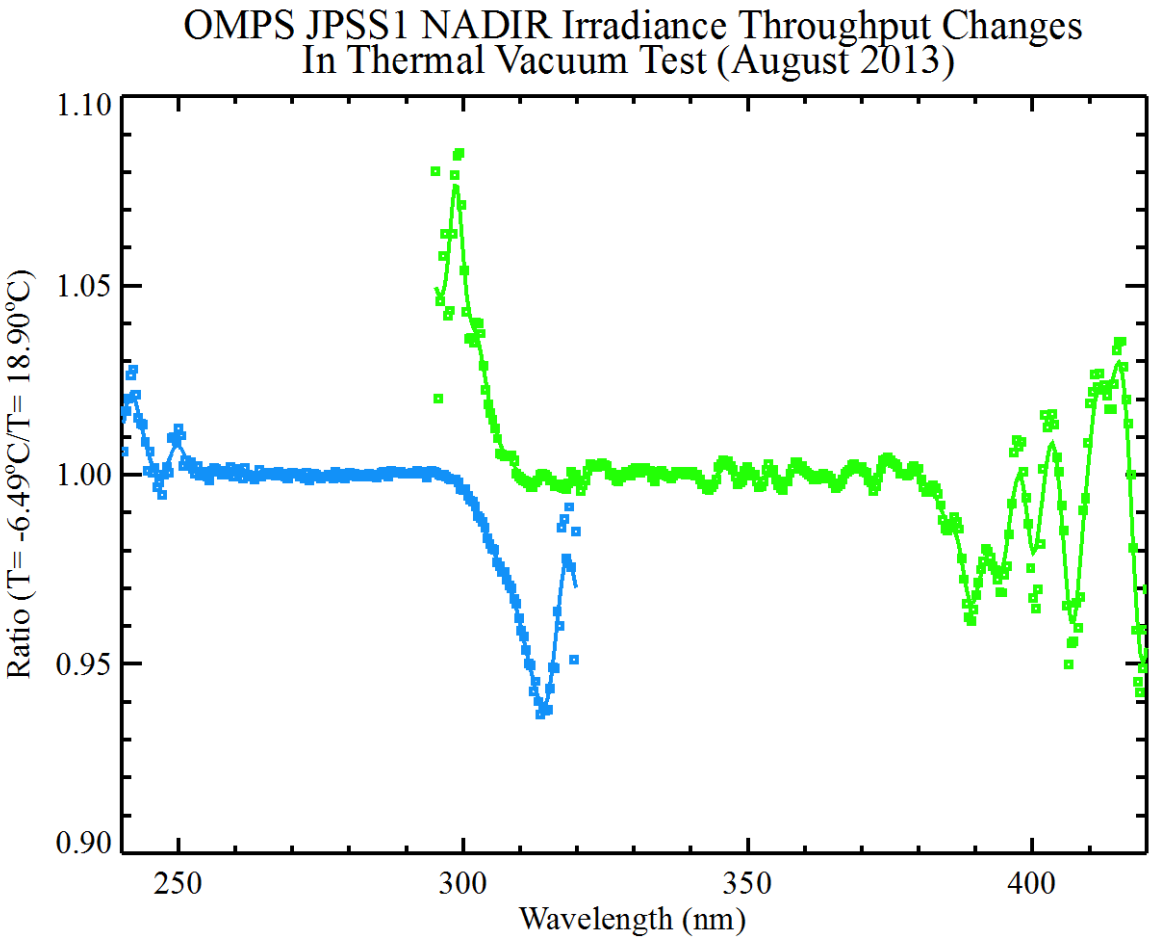


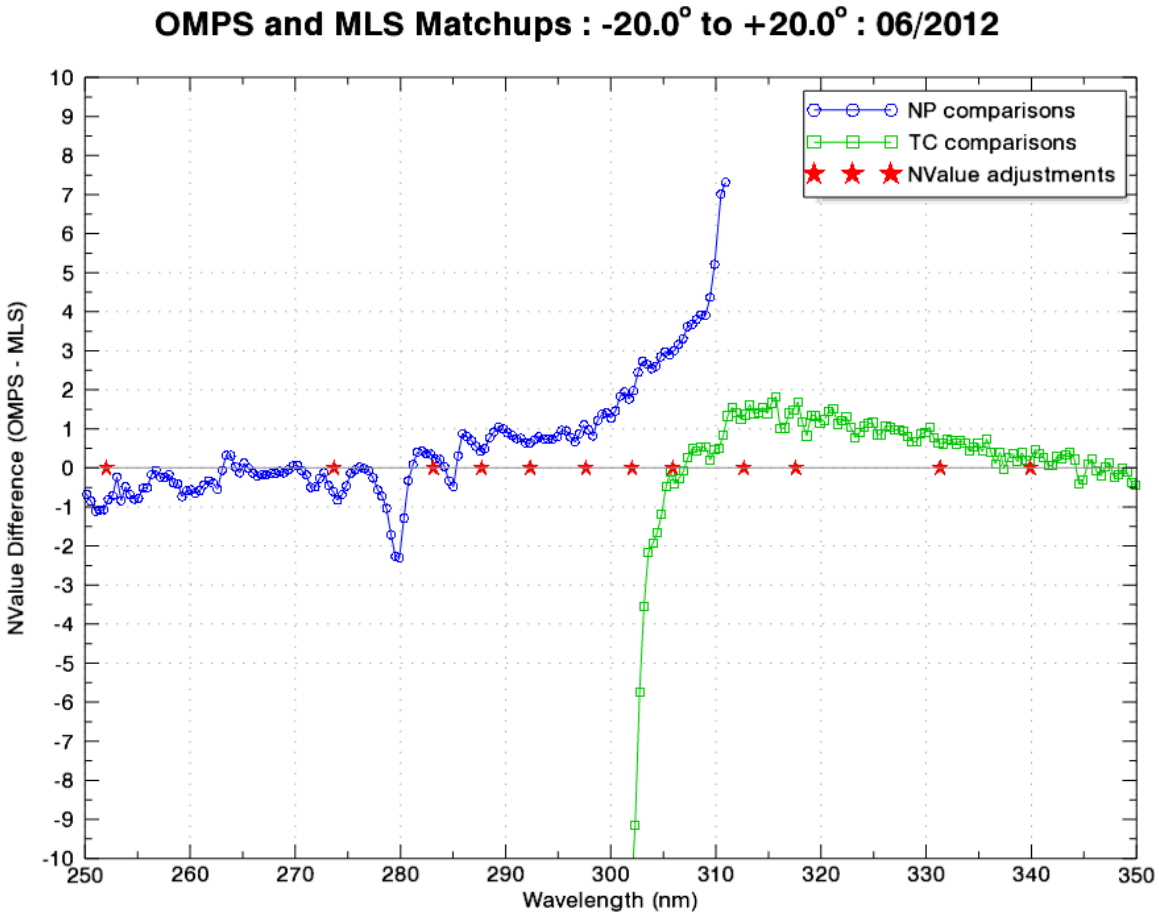


Adjustments needed to account for changes in throughput, particularly in dichroic region

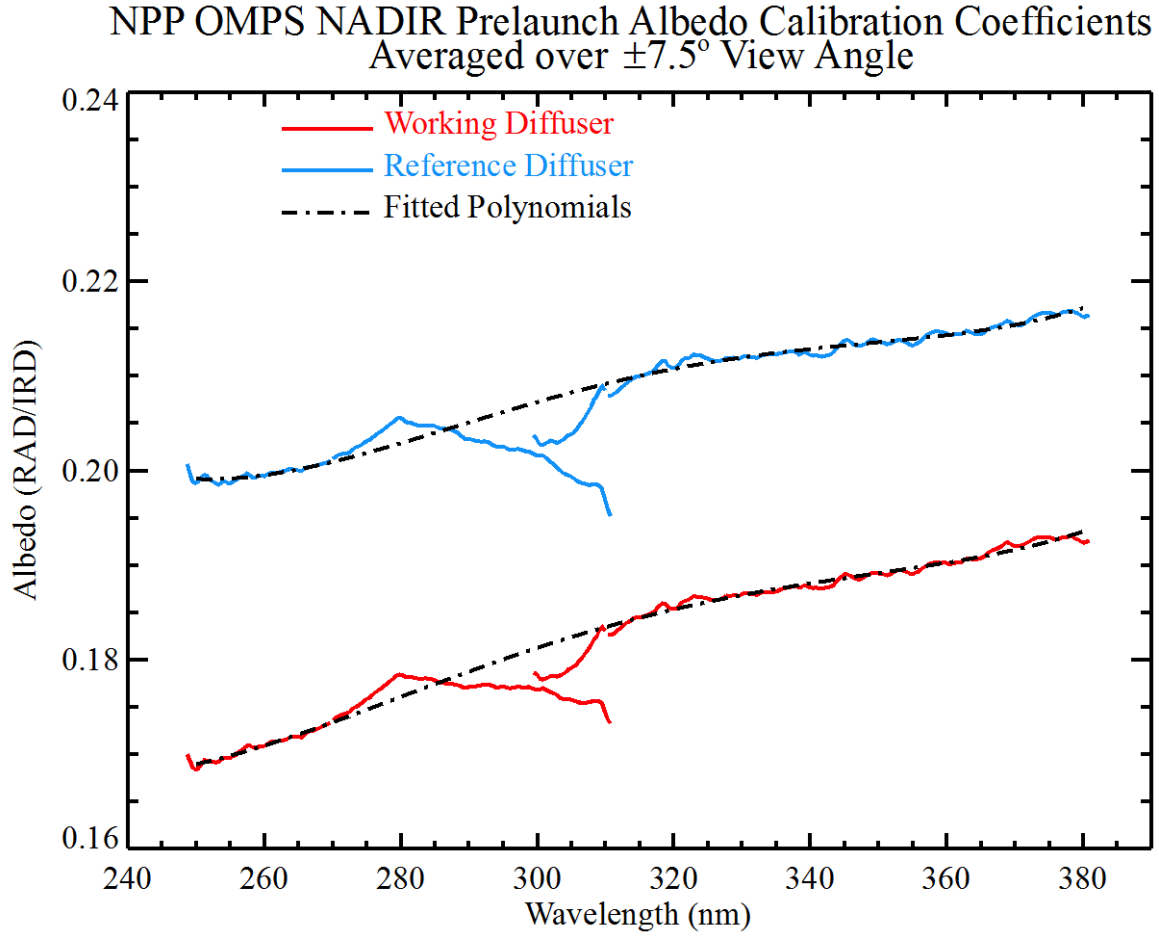


V1 OMPS/MLS matchup comparisons showed problems unrelated to dichroic adjustment

- MLS ozone/temp profiles from matched up dataset used in radiative transfer calculations of normalized radiances
- Calculated NR compared to OMPS measured NR
- N values difference compared
  - $N = -100\log_{10}(NR)$
  - ΔN = -2.3% radiance difference

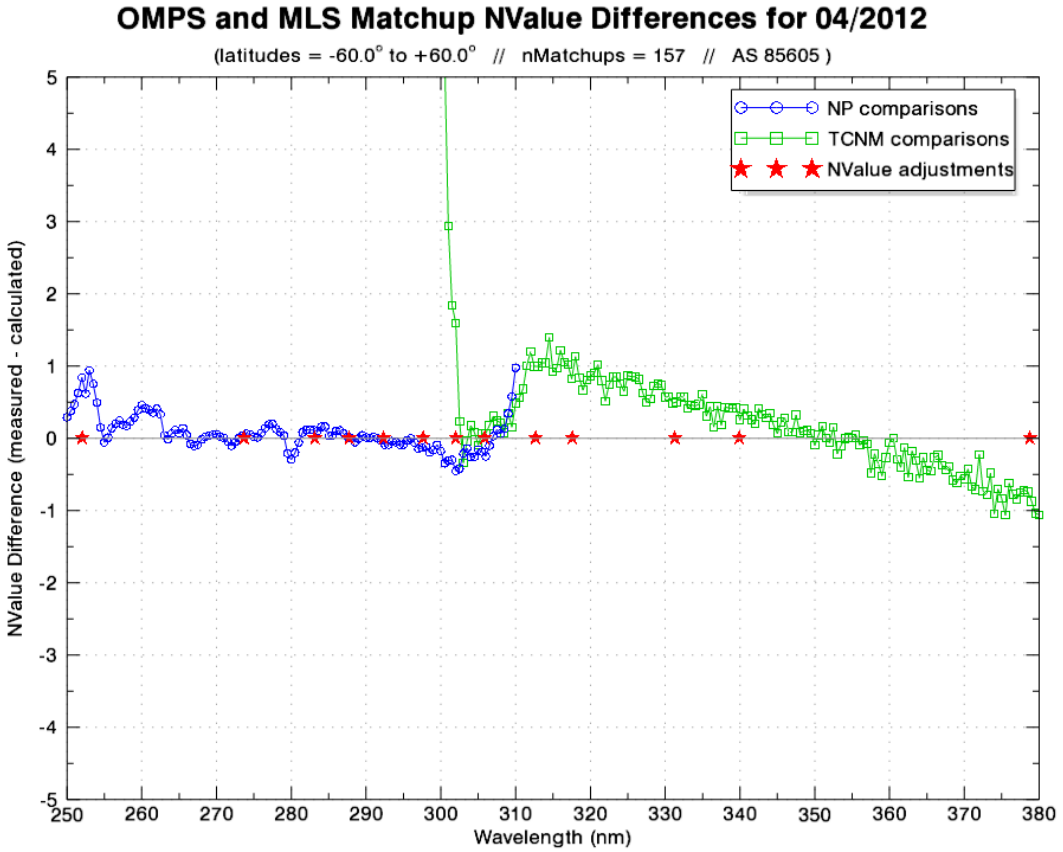


Adjustments needed to account for "unphysical" behavior of cal coefficients

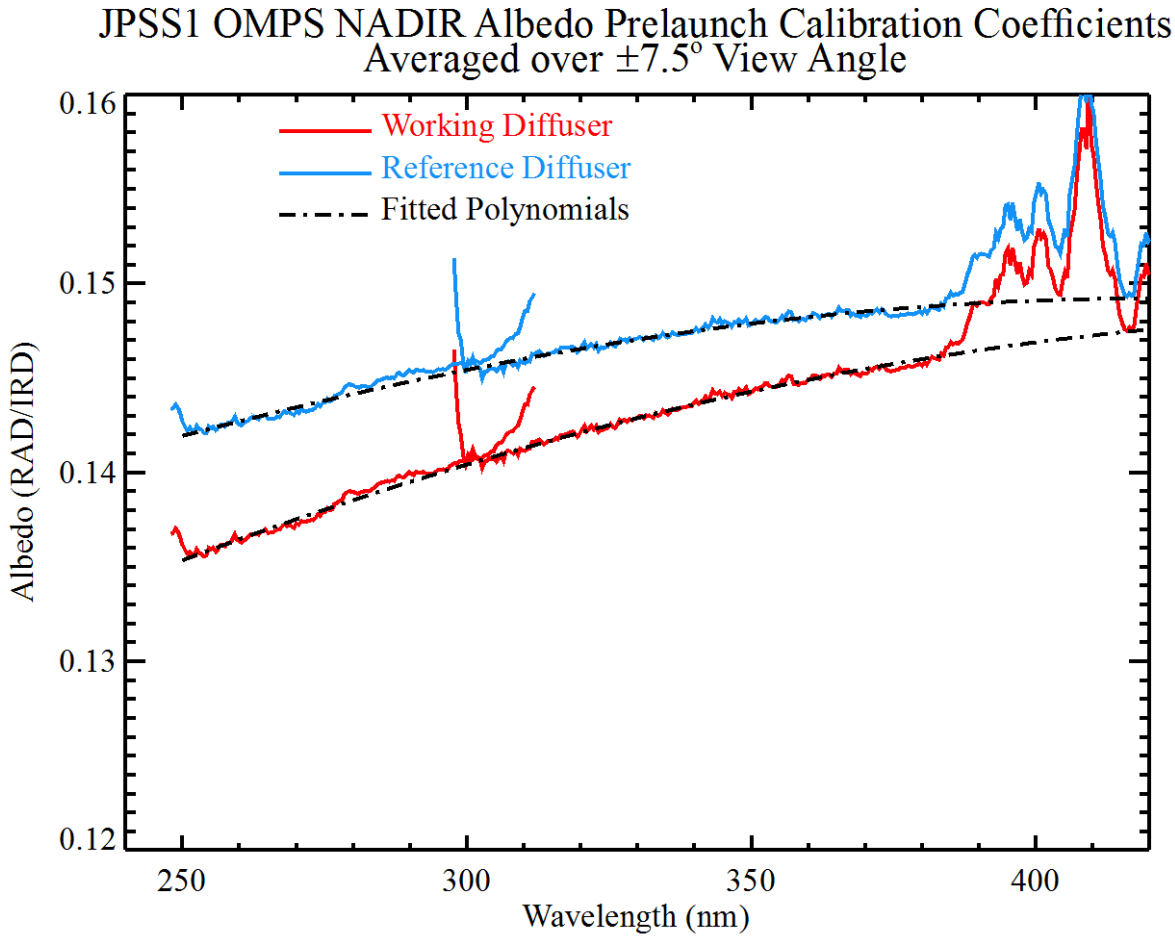


V2 OMPS/MLS matchup comparisons showed better performance with new coefficients

- Includes corrections for dichroic region
- Includes corrections for stray light



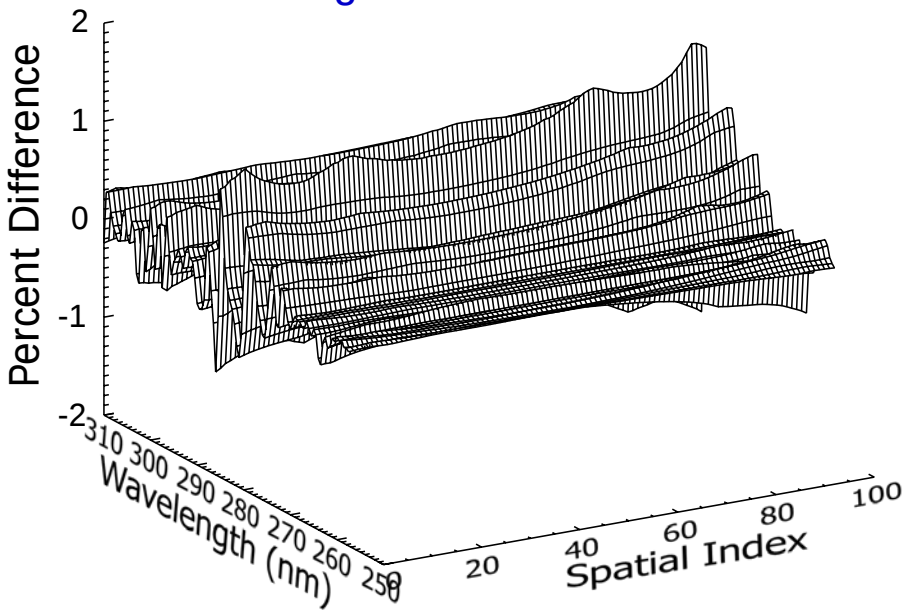
J1 calibration coefficients show the same type of unphysical behavior



Corrections for incorrect S-NPP NP bandpasses are being evaluated

- Data provided by Ball contain errors in channel bandcenters
  - J1 also had problems with measurements around 295 nm
- The following changes are currently being evaluated to determine their effect on S-NPP NP retrieval performance
  - Weighted average bandcenter correction
  - Fit with/without 295 nm measurements
  - Adjustment for change in sensitivity across dichroic region

Comparisons of synthetic solar flux convolved with weighted average bandcenter correction to solar flux without correction



Path forward for NPP nadir sensors

- Version 2
  - Freeze current NASA processing
  - Includes dichroic adjustments, stray light correction, wavelength shift corrections into L1b processing stream
  - Includes “soft calibration” adjustments for V2 processing.
  - Includes new “Day 1” measured solar flux
    - Created using solar measurements from April/May of 2012
    - Used to create normalized radiances for retrieval algorithms
  - Run through 2015 “ozone hole season”
- Version 2.1
  - Use updated NP bandpasses
    - Only if evaluation indicates such a change is necessary
  - Incorporate “tweaked” stray light correction
  - Add a few “enhancements” to L1B processor
    - Determine FOV corners, add to L1B file