OMPS Nadir Radiometric Calibration

Colin Seftor, Glen Jaross, Liang-Kang Huang, Rama Mundakkara, Mark Kowitt
Both the NM and NP sensors are extremely stable.
Both the NM and NP sensors are extremely stable.
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
- \( N = -100 \log_{10}(NR) \)
  - \( \Delta N = -2.3\% \) 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