

**ARM Science Team Meeting 2007**

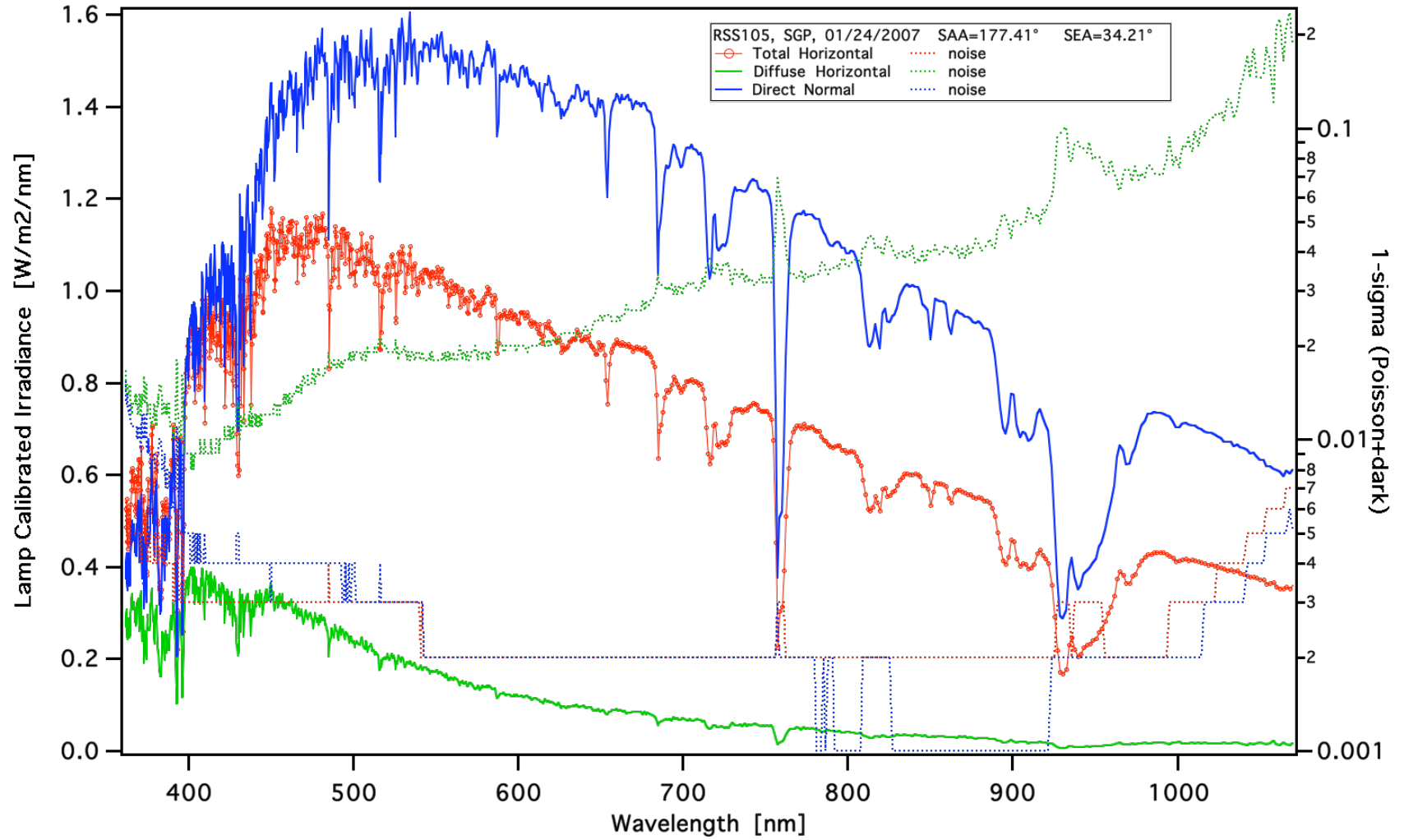
**Brief guide to RSS for SW QME**

**Peter Kiedron**

## **RSS105 Data in ARM Archives**

- **Sampling rate 1/min**
- **1040 nominal pixels reported**
- **999 useable pixels from 362nm-1070nm (pixel 523 unreliable!)**
- **Tot, Dif and DirNorm irradiances in W/m<sup>2</sup>/nm**
- **Wavelength *nm-to-pixel* assignment for each scan reported**
- **Poisson+Dark 1-sigma noise for each scan reported**
- **Responsivity interpolated from biweekly lamp calibrations with PortCal**
- **Irradiance scale traced to NIST via a single Licor Lamp (ORL787)**
- **Irradiance scale stability tested bimonthly as Licor/PortCal ratio ( $\pm 1\%$  1-sigma)**

# RSS data from ARM Archives



## **Corrections Performed for Archived Data**

- **Cosine correction from pre-deployment file both for direct and diffuse**
- **Dark correction for each scan**
- **Wavelength grid for each scan from Correlation Fraunhofer Algorithm**
- **Non-linearity correction from biweekly calibrations**
- **Biweekly calibrations to normalized short term instability**

## **Extra ARM Data Stream Corrections**

<http://iop.archive.arm.gov/arm-iop/0special-data/asrc-rss/rss105/langley/>

- **Langley regressions on lamp calibrated data**
- **“Forgan process” on  $V_o$ 's from Langley regression**
- **Interpolation over the telluric bands in final  $V_o$ 's**

# Available Instrument Characterization Files

<http://iop.archive.arm.gov/arm-iop/0special-data/asrc-rss/>

- **Cosine files**

rss105s2n.030416\_040809 and rss105w2e.030421\_040809

- **Day Zero wavelength grid**

nm\_and\_fy\_precursors.txt

- **Resolution fwhm (top +95% is Gaussian)**

rss105\_GaussWidth.txt and rss105\_fwhm\_pix.txt

- **Filter functions with estimated stray light (1040x2080 array)**

rss105\_ff\_respEQ1.txt

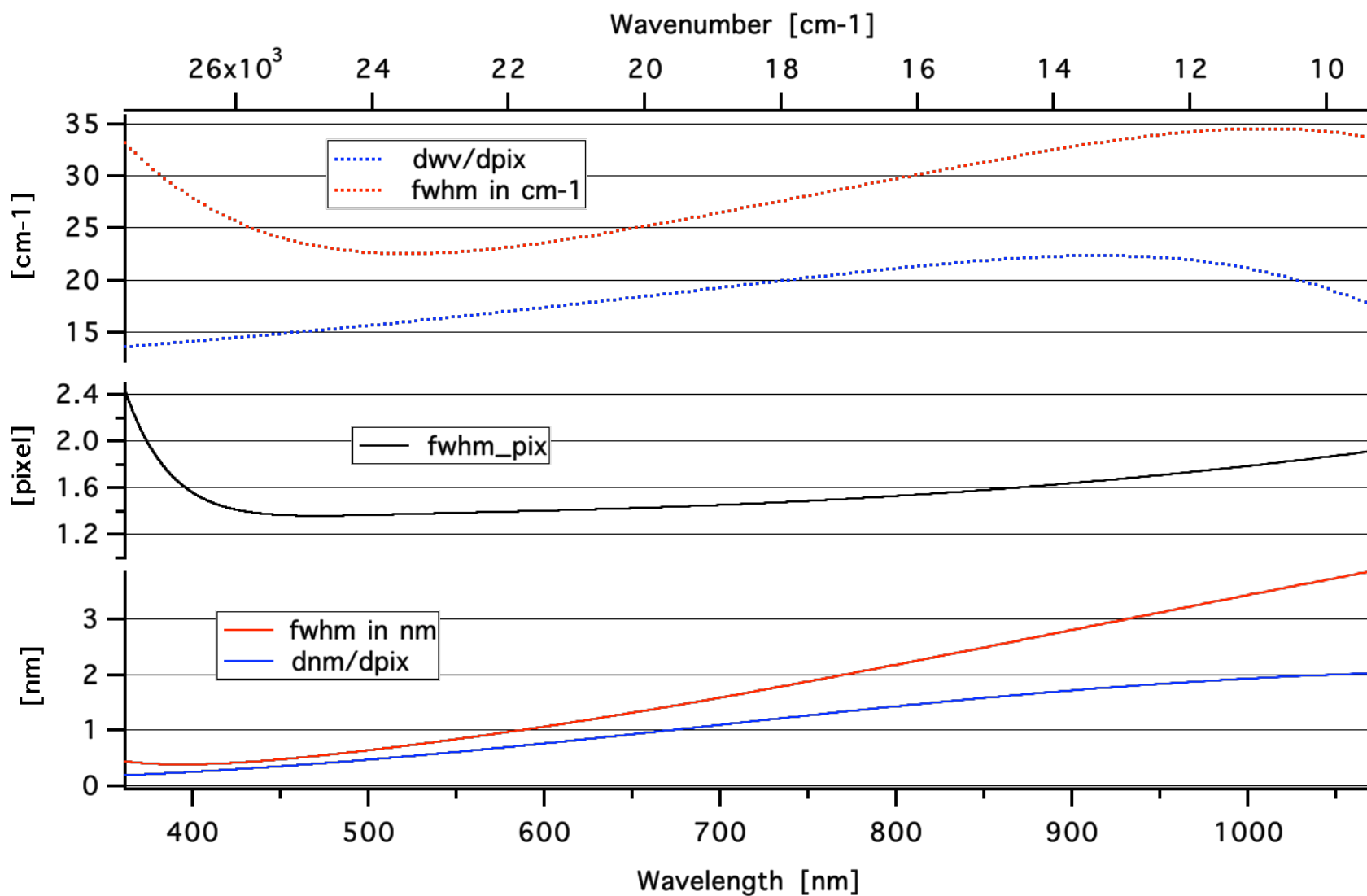
- **Documentation**

README.html, 00ReadMeFiltFunc\_rss105 and ReadMe\_CosCor

- **Manuals, Algorithm Description, Papers, Presentations, etc.**

[http://www.arm.gov/publications/tech\\_reports/handbooks/rss/](http://www.arm.gov/publications/tech_reports/handbooks/rss/)

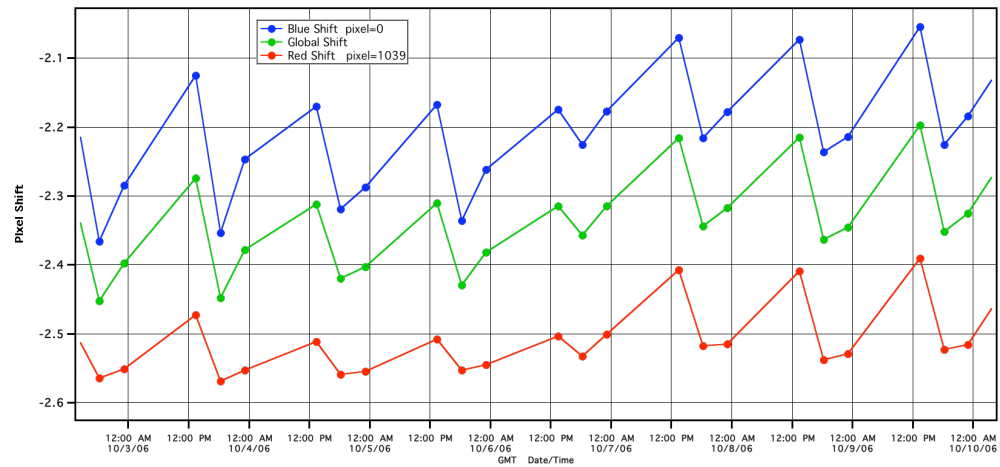
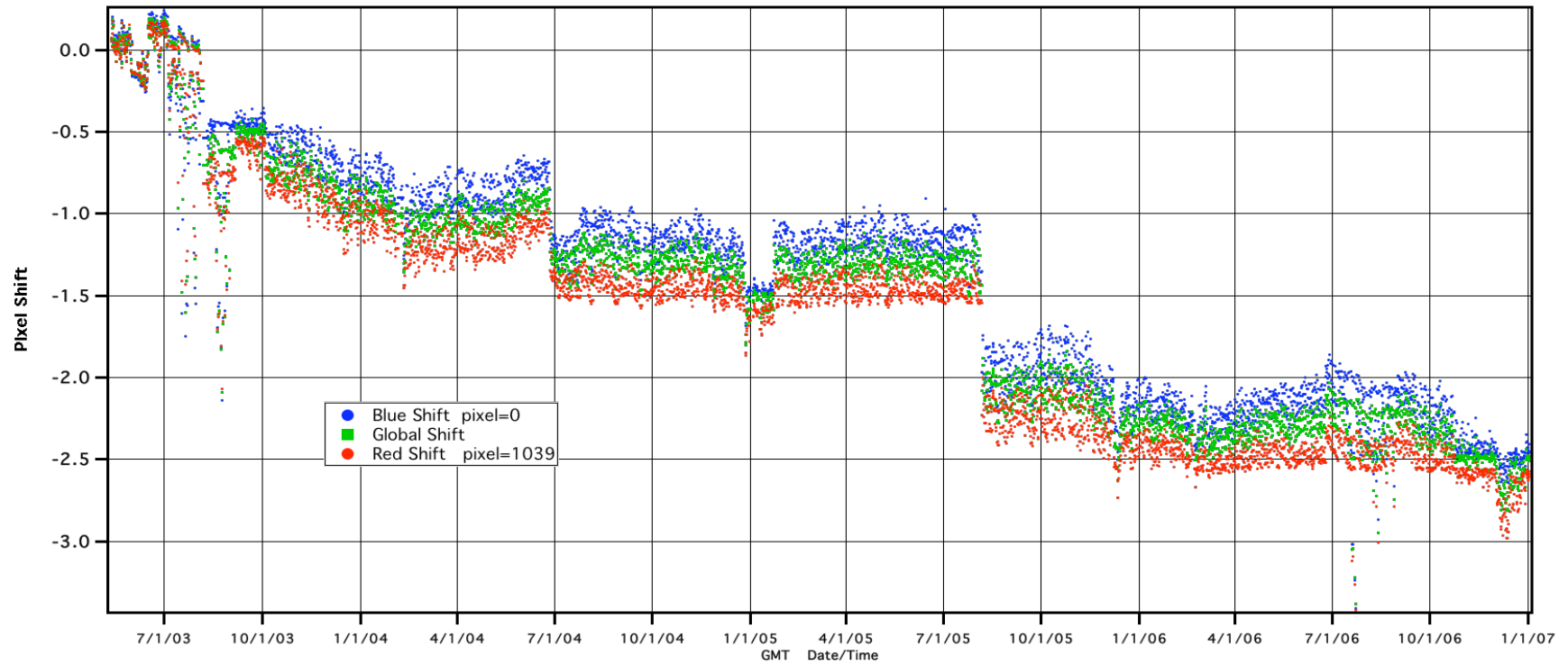
# Spectral sampling rate and resolution



## **Known problems**

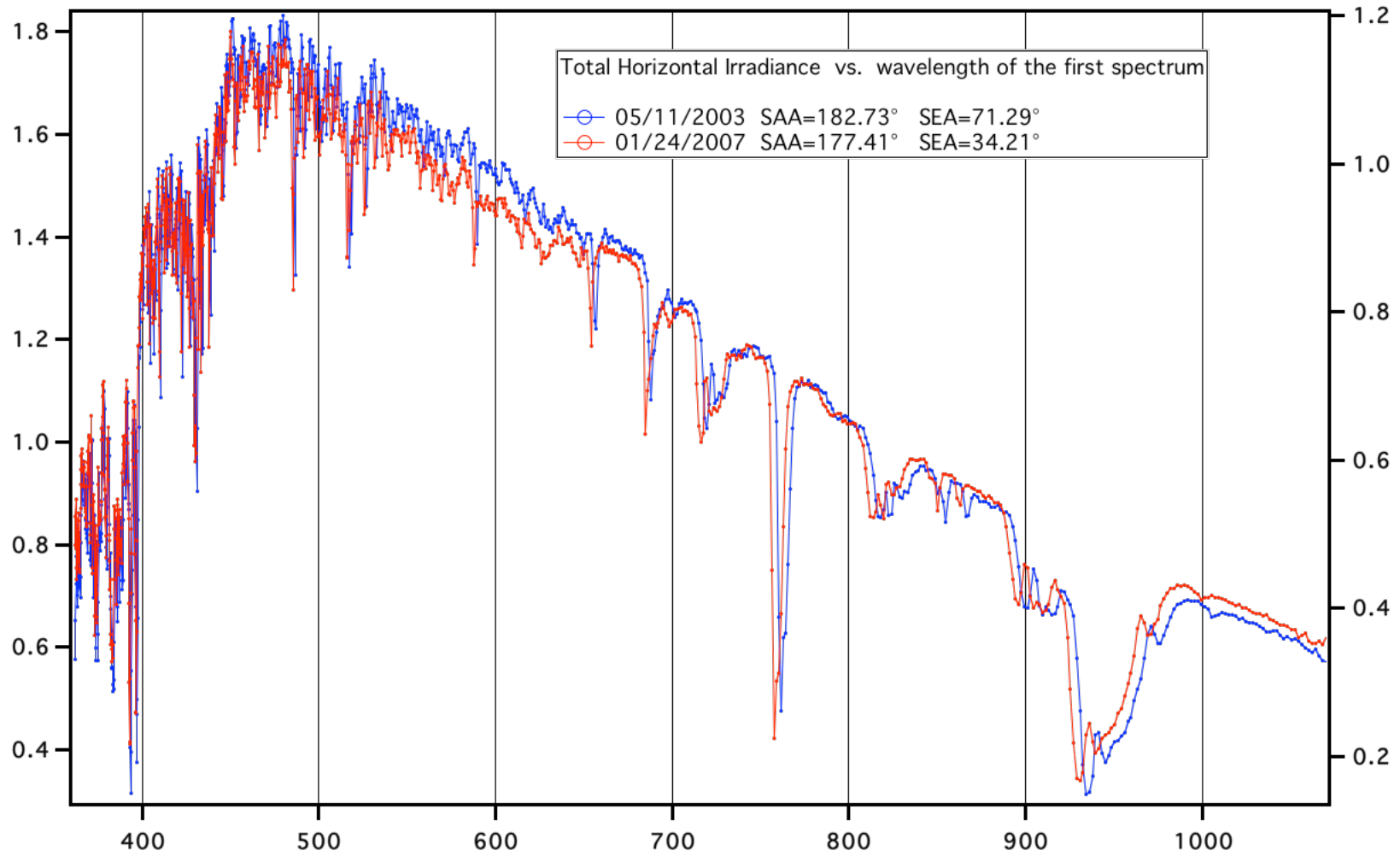
- **Nonlinearity (corrected)**
- **Short term radiometric instability (corrected)**
- **Pixel=523 unreliable (not corrected)**
- **Wavelength diurnal and long term drifts (corrected)**
- **Two short periods of erratic shading (documented in Mentor Reports)**
- **Occasional but rare single pixel spikes (not filtered nor detected)**
- **Possible offset/nonlinearity error in clear sky (small SZA) may underestimate diffuse for >750nm wavelengths.**

# Wavelength drift - temperature and mechanical

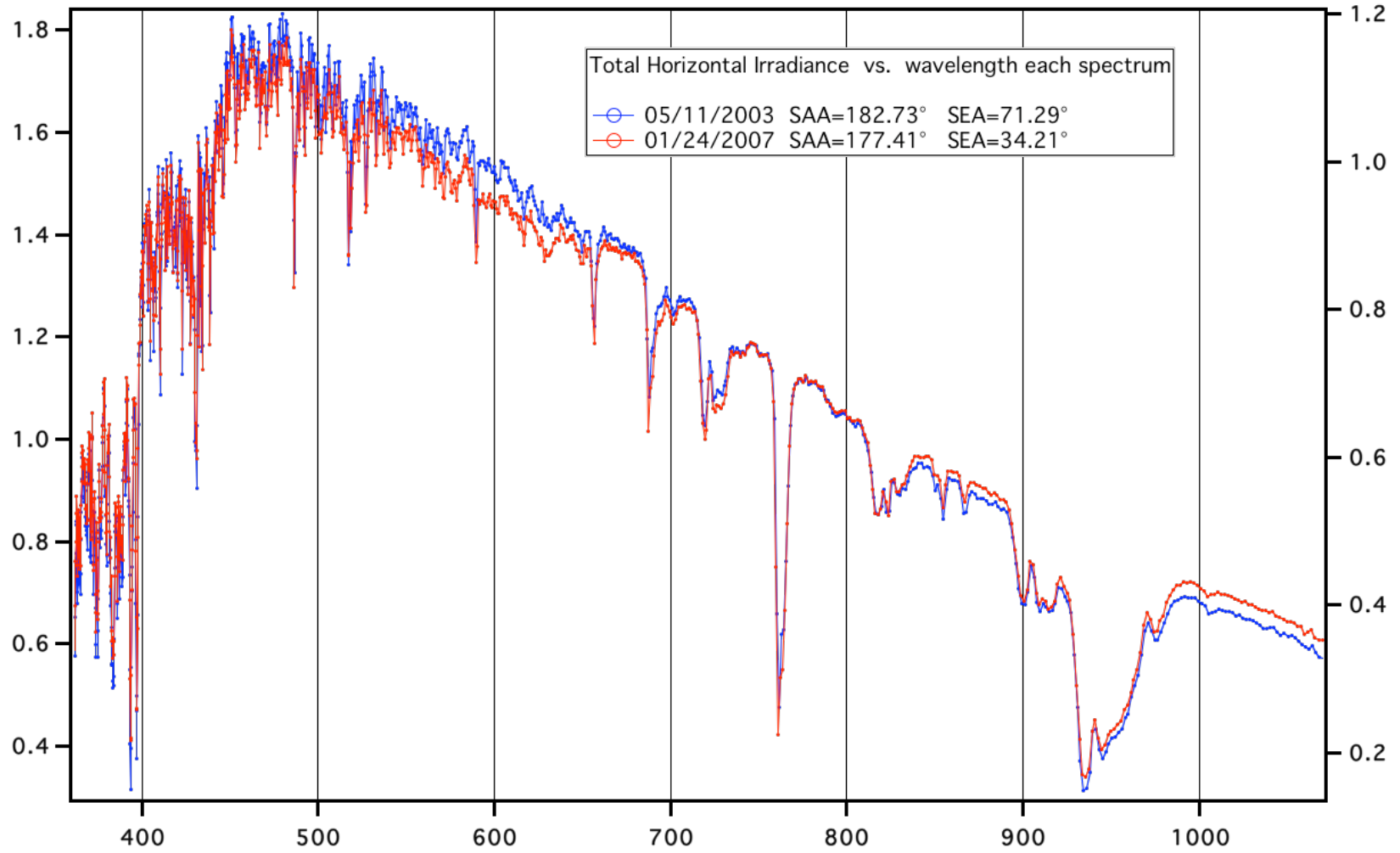




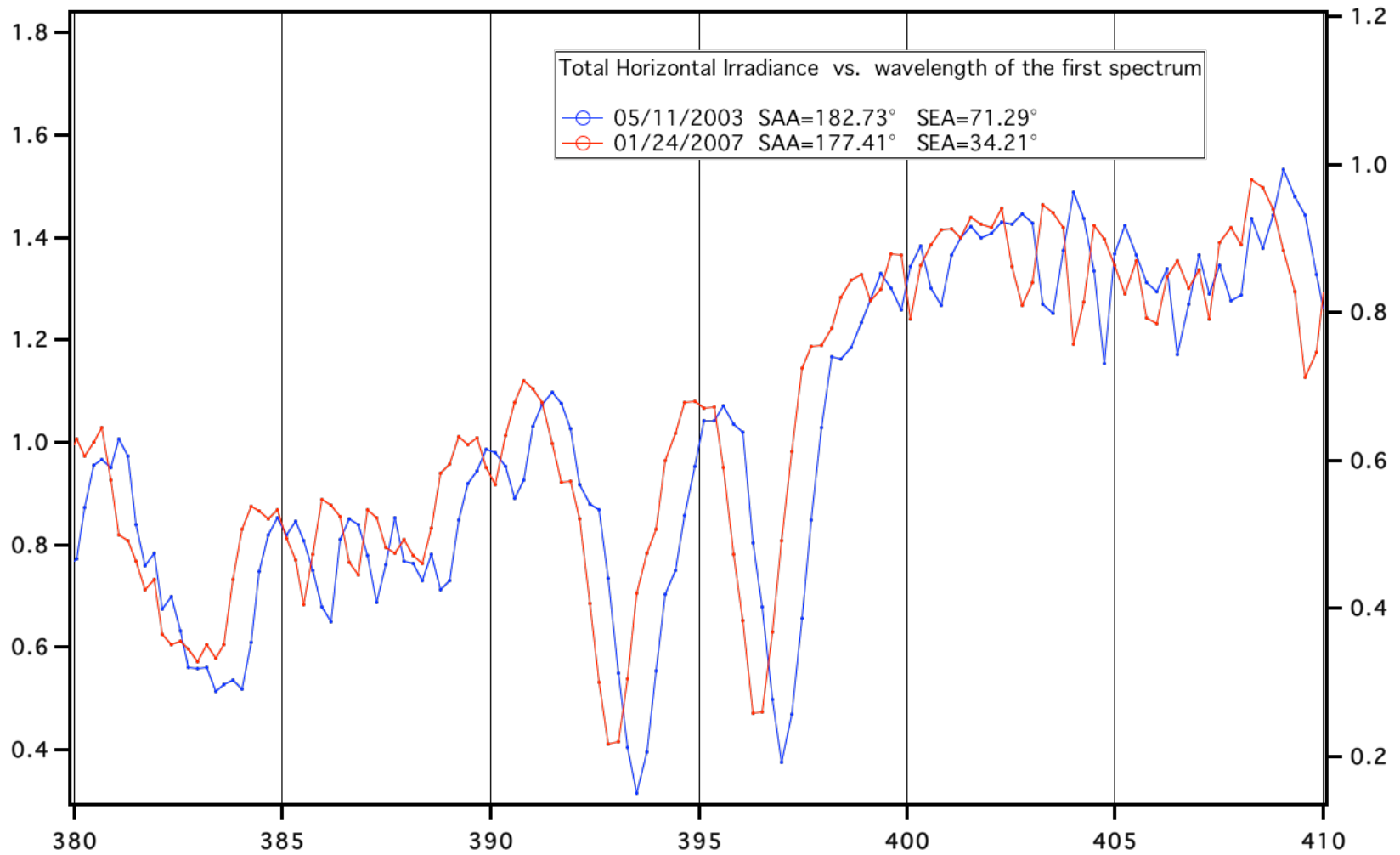
# Wavelength shift between two spectra 32 months apart



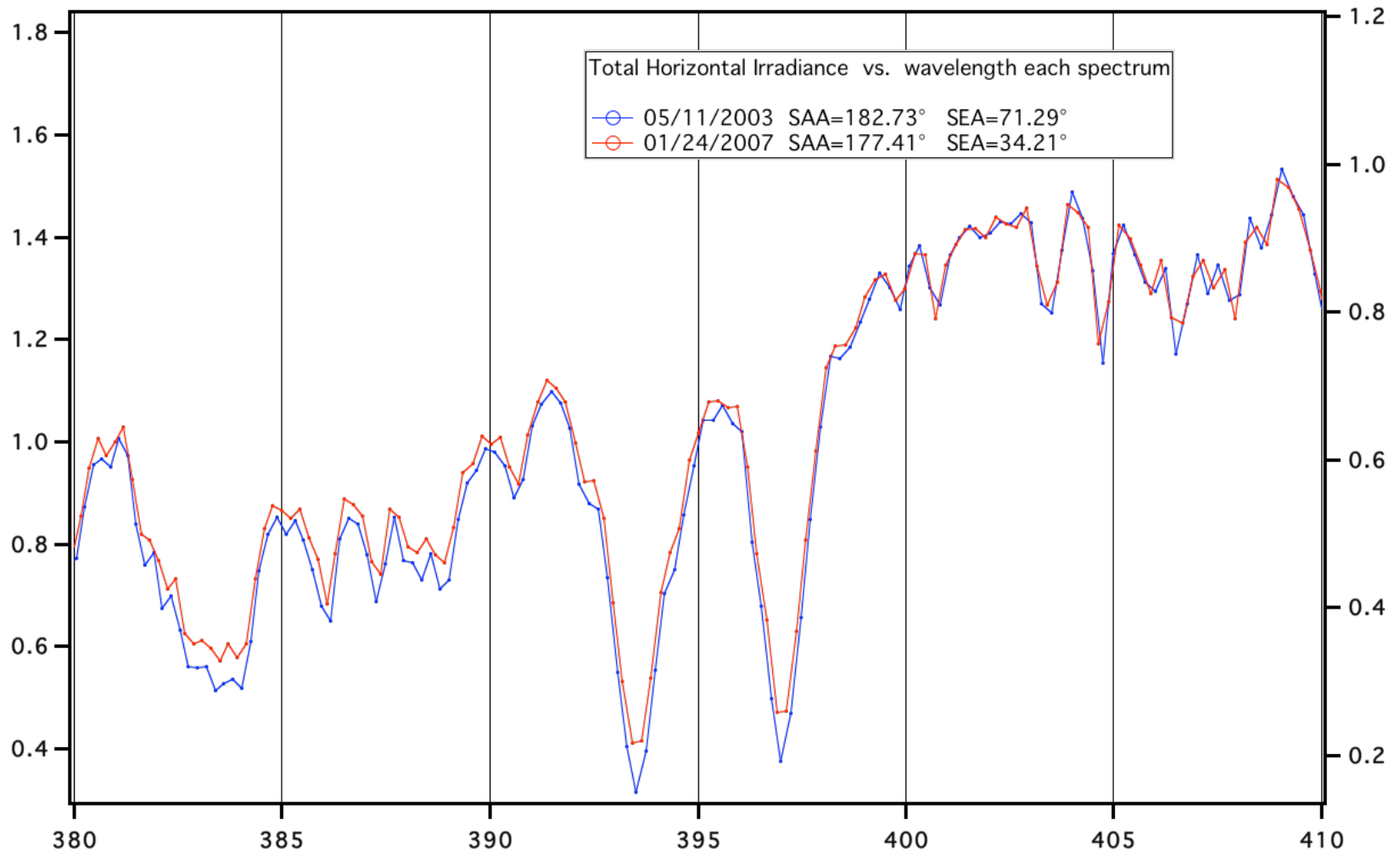
# Wavelength shift corrected



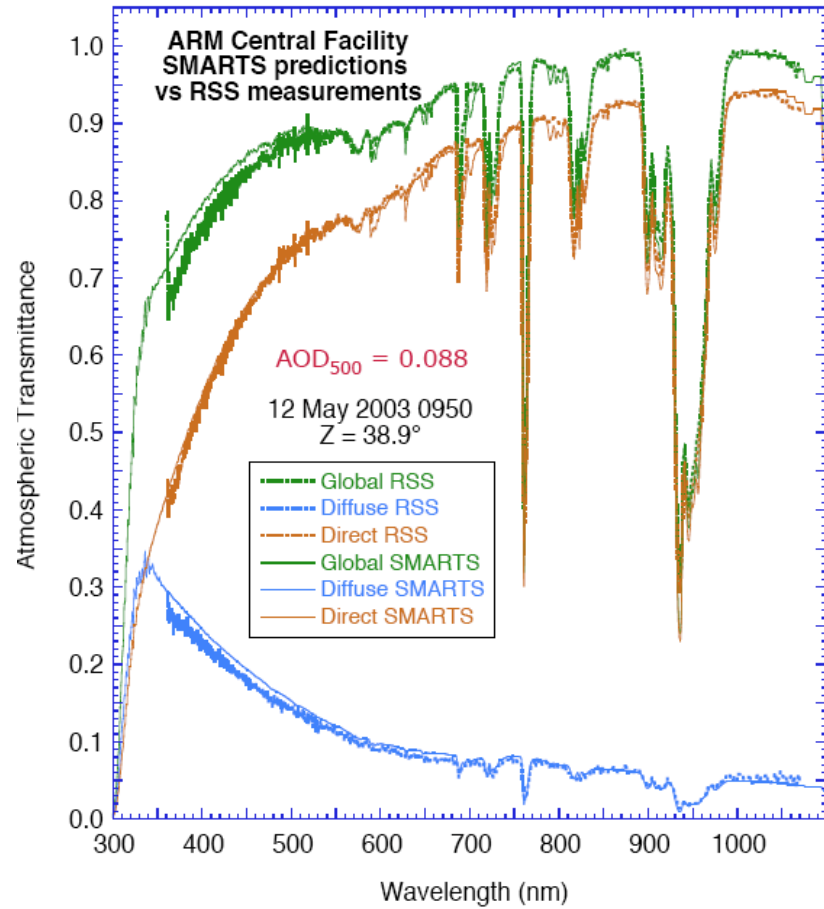
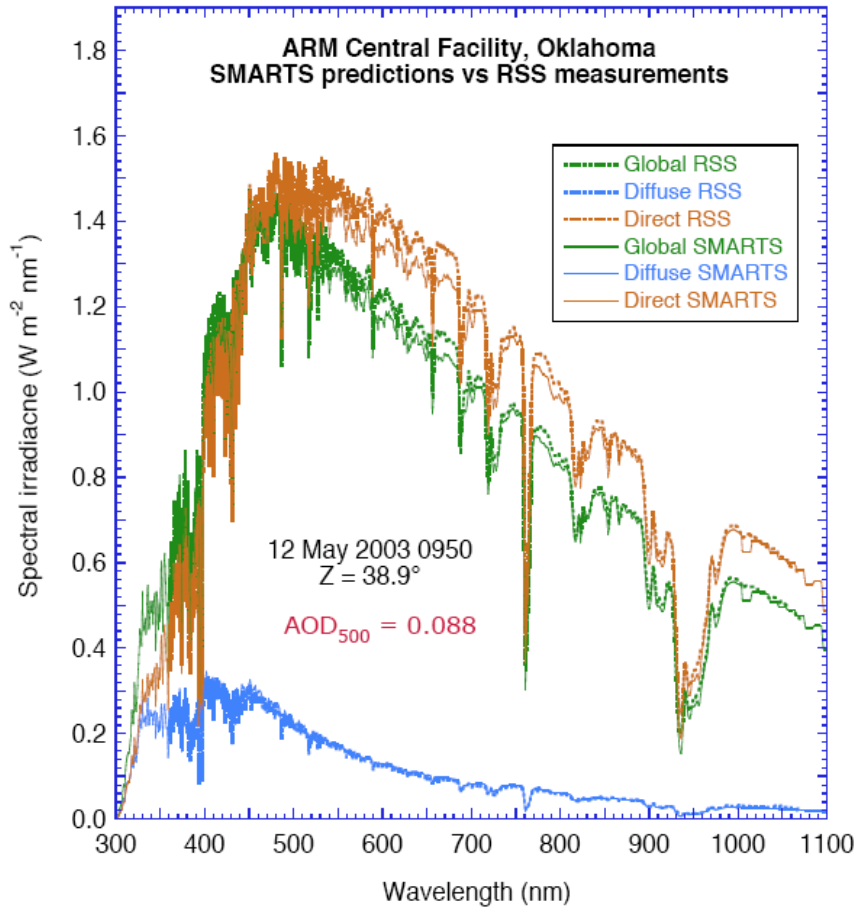
# Wavelength shift between two spectra 32 months apart



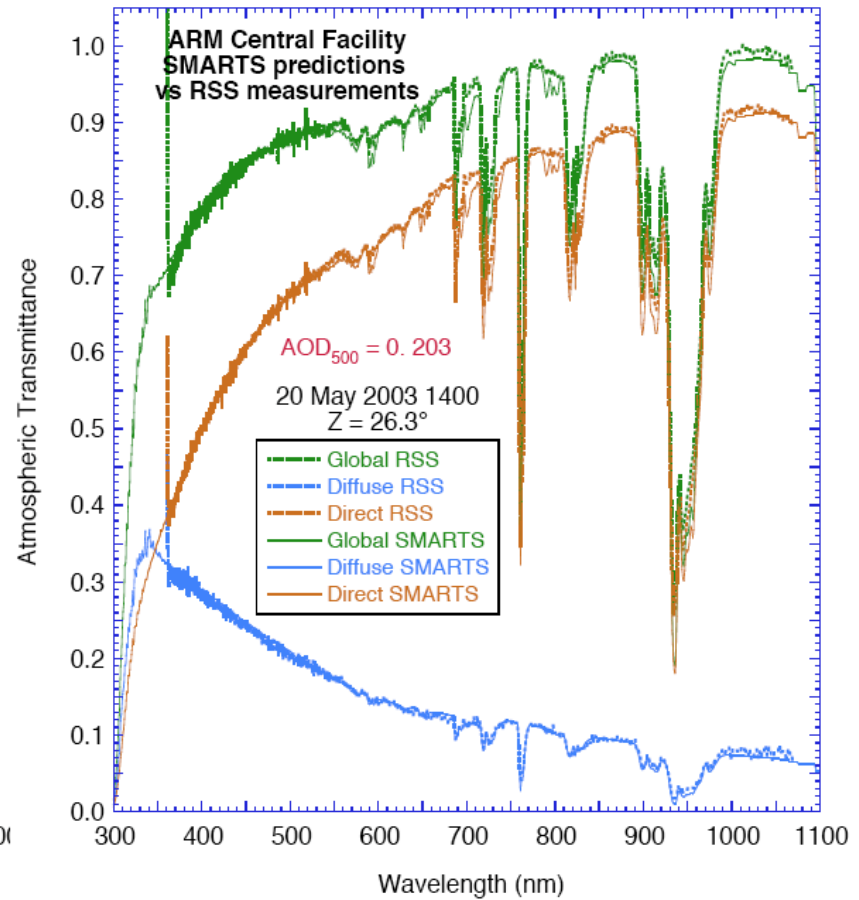
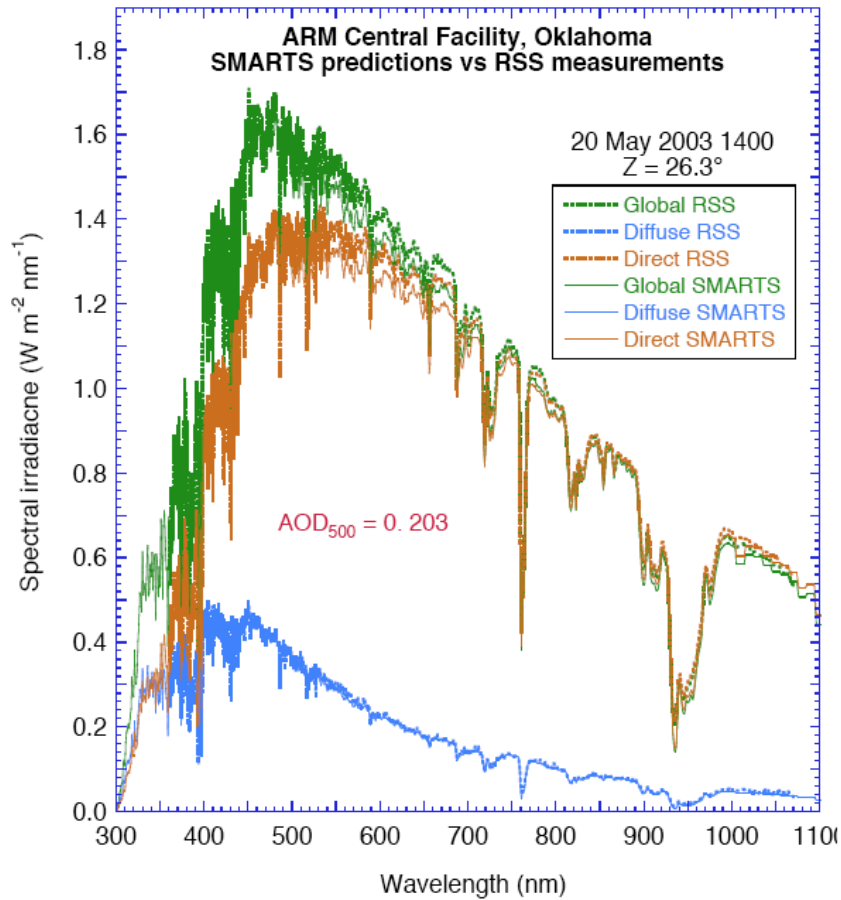
# Wavelength shift corrected



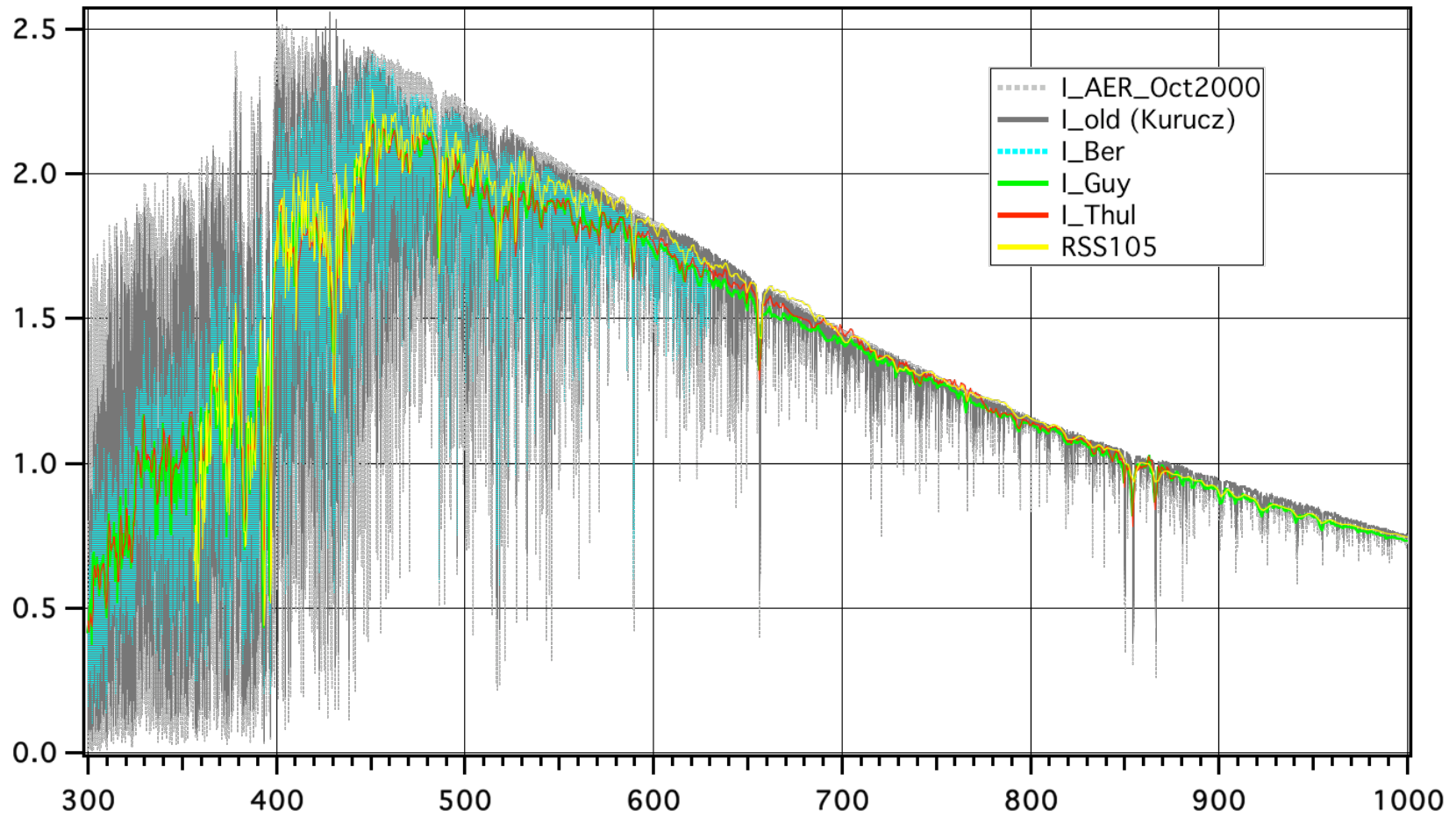
# IRF WG Meeting October 2006



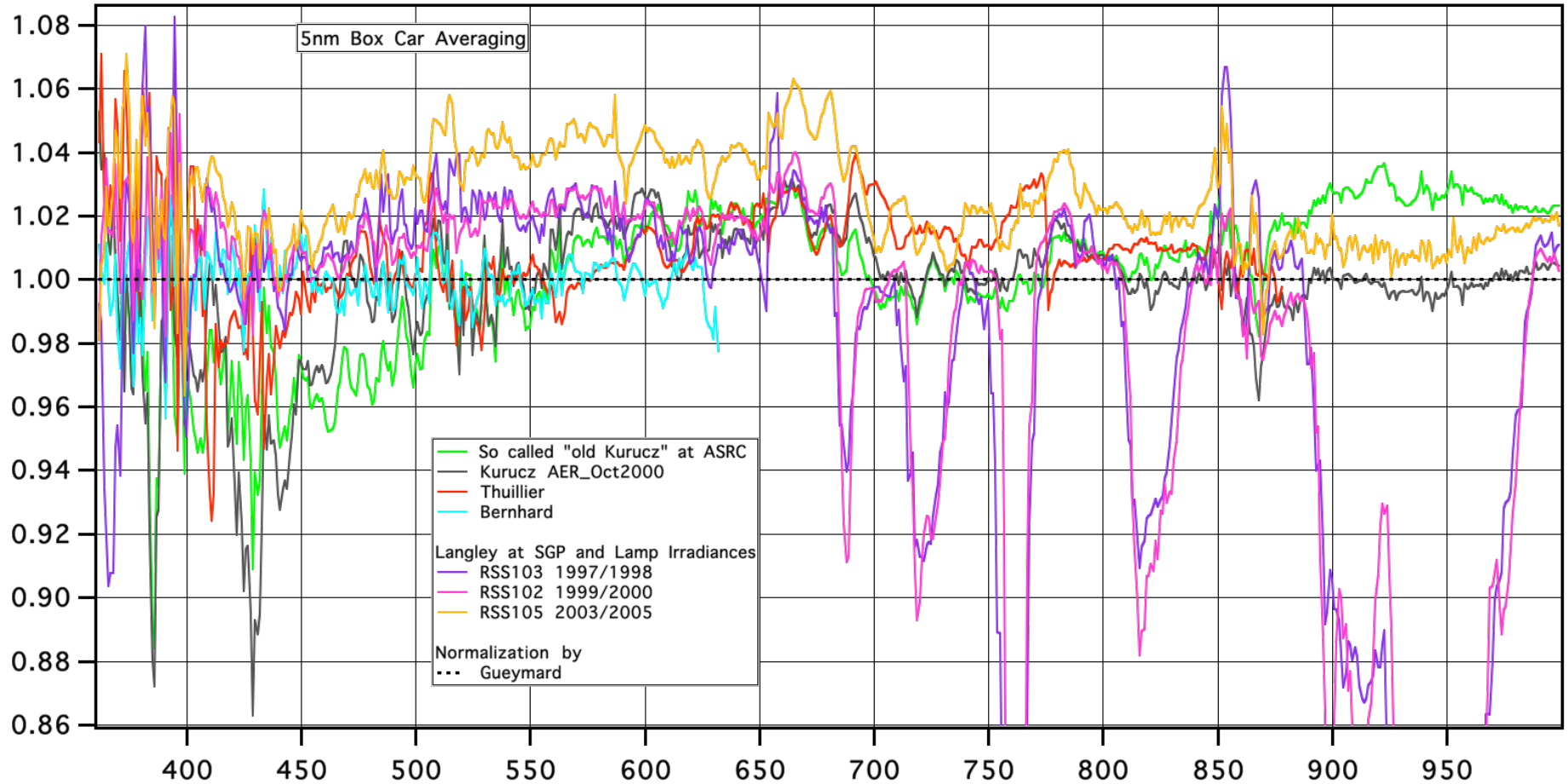
# IRF WG Meeting October 2006



# ETS's, SSF's and EASI's

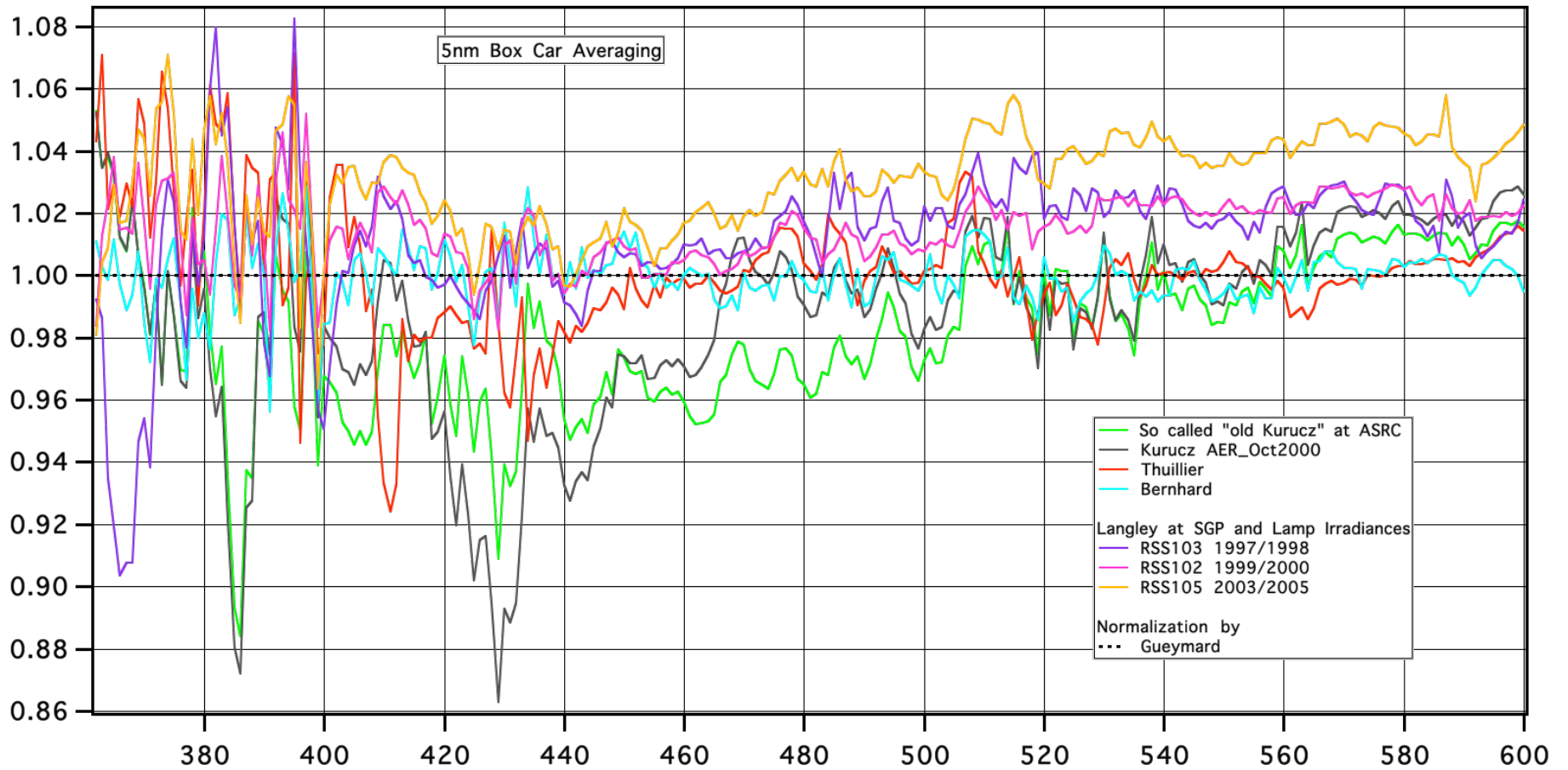


## Ratios at 5nm box-car resolution





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