PACS Spectrometer
RSRF reconstruction
from unchopped OFF-position scans
draft v0.1

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ASRF/RSRF from off-scans

- Goal: invert ASRF from 160 unchopped off-position observations (figures show only ~20% of the data analysed so far)
- Standard mode science- and calibration observations, only Nyquist spectral sampling
- $ASRF(x,y,\lambda,t) = [S(x,y,\lambda,t) - D(x,y)]/Tel(x,y,\lambda,t)$, D(x,y) is the nominal dark

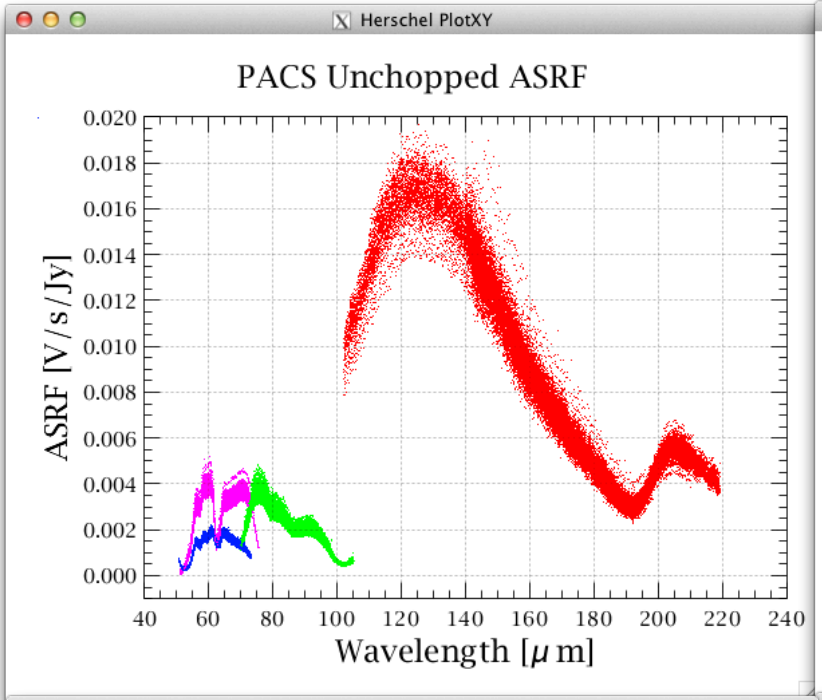
a) $RSRF(x,y,\lambda) = \langle ASRF(x,y,\lambda,t) / RcalBlock(x,y,\lambda_{key},t) \rangle$

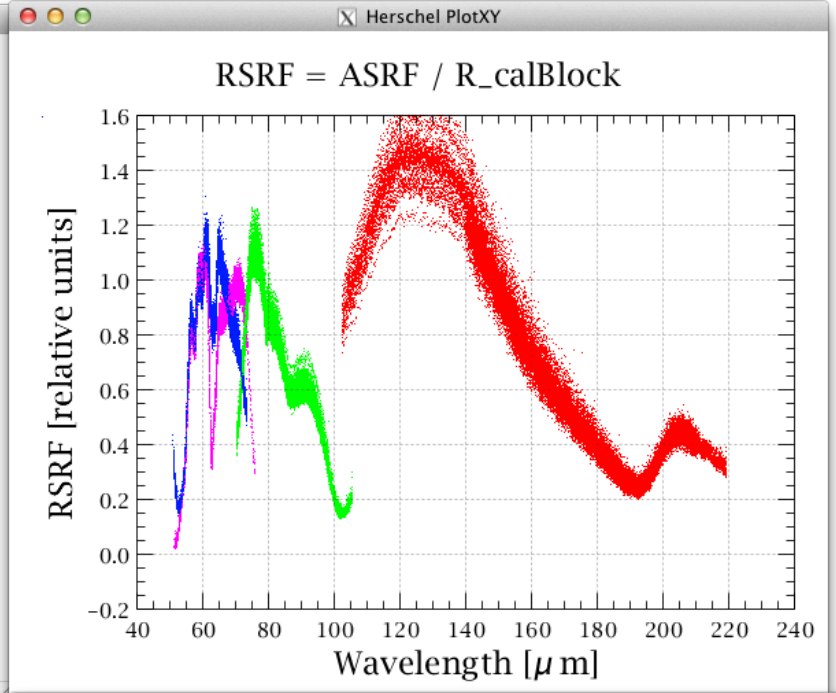
  - Response is taken from calBlock

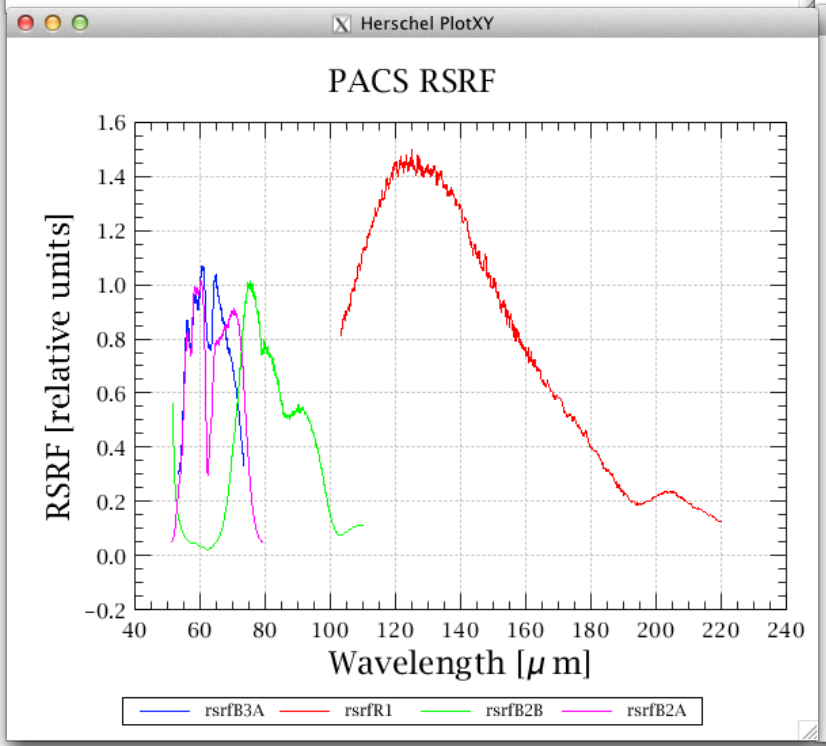
b) $RSRF(x,y,\lambda) = \langle ASRF(x,y,\lambda,t) / ASRF(x,y,\lambda_{key},t) \rangle$

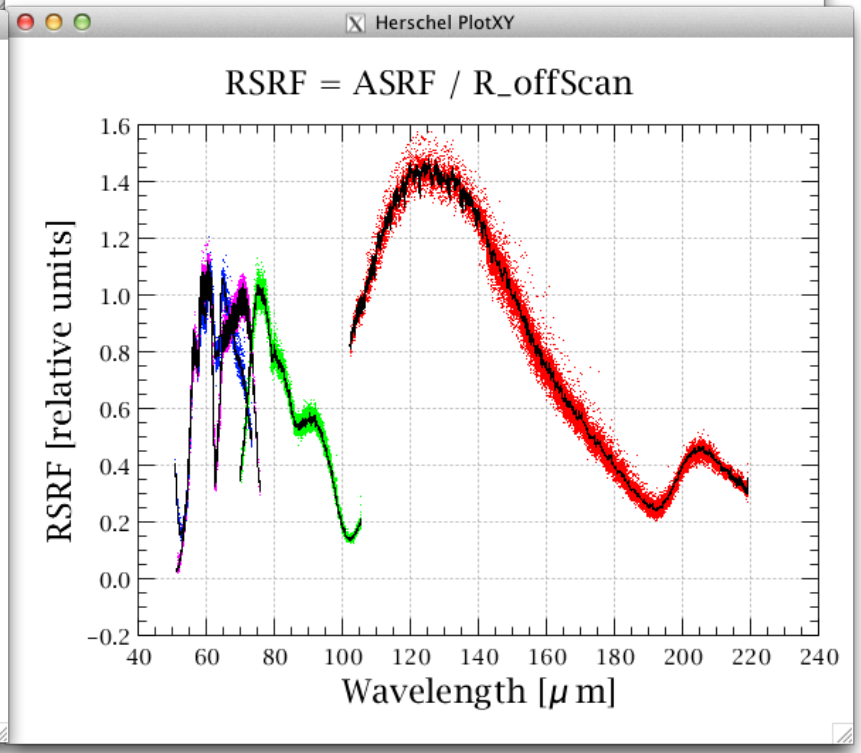
  - specBaselineEstimator fit to ASRF, normalized at key wavelengths

- AlPog telescope background model with aging (9 July 2012)
  - TM1 is adopted from T331 sensor (CCUA) reading (+Z-axis position) for the observation half-time
  - Epoch (for aging effect) is adopted at od.00
- up/down scans are averaged out per observation on standard waveGrid



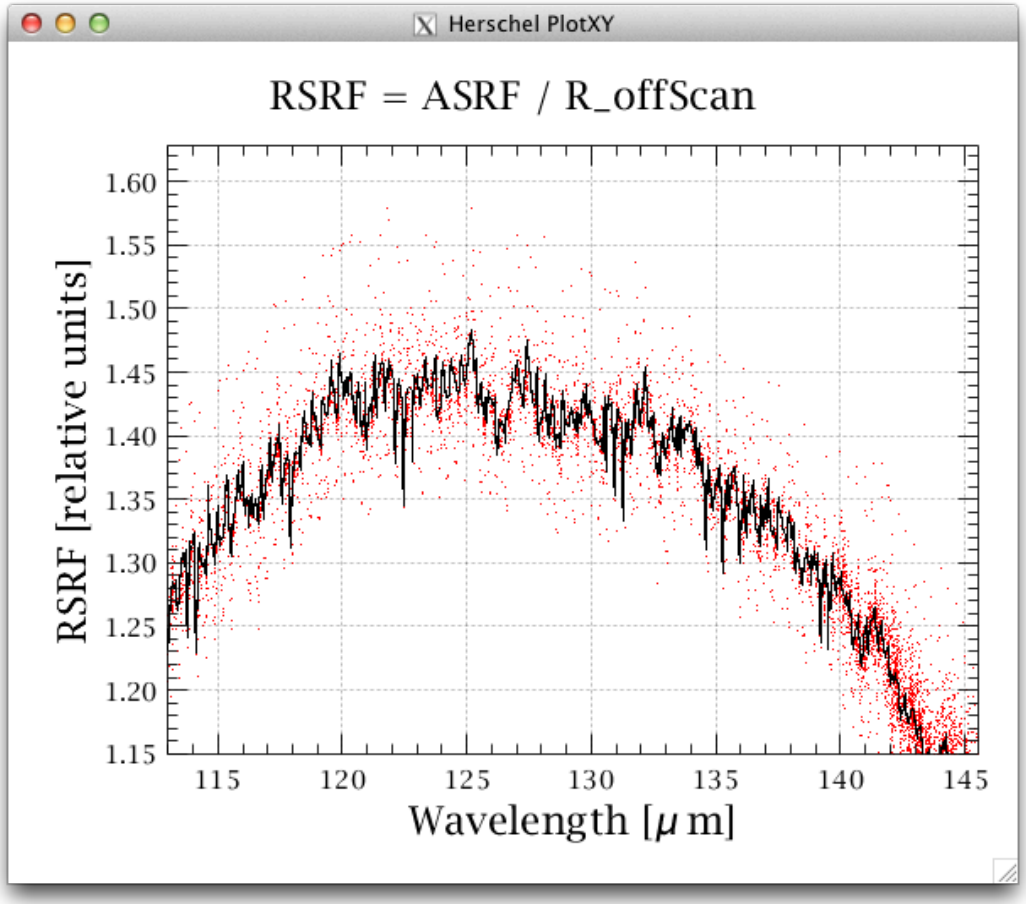


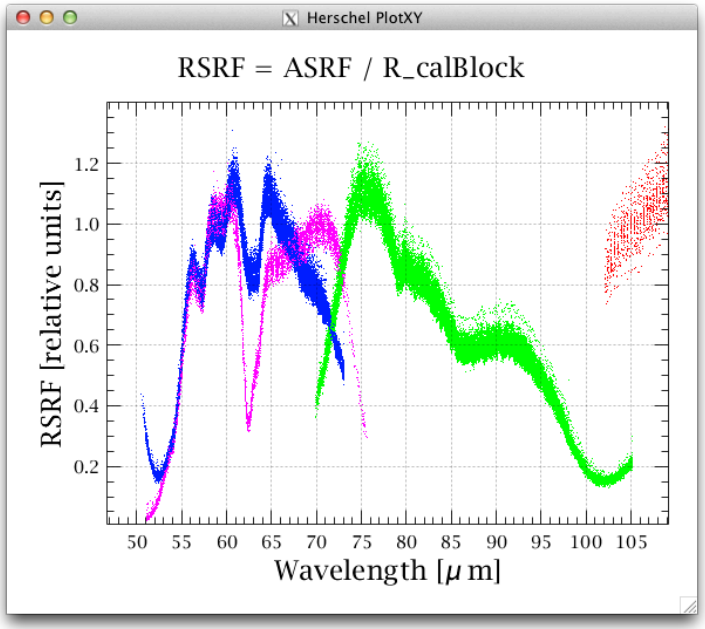


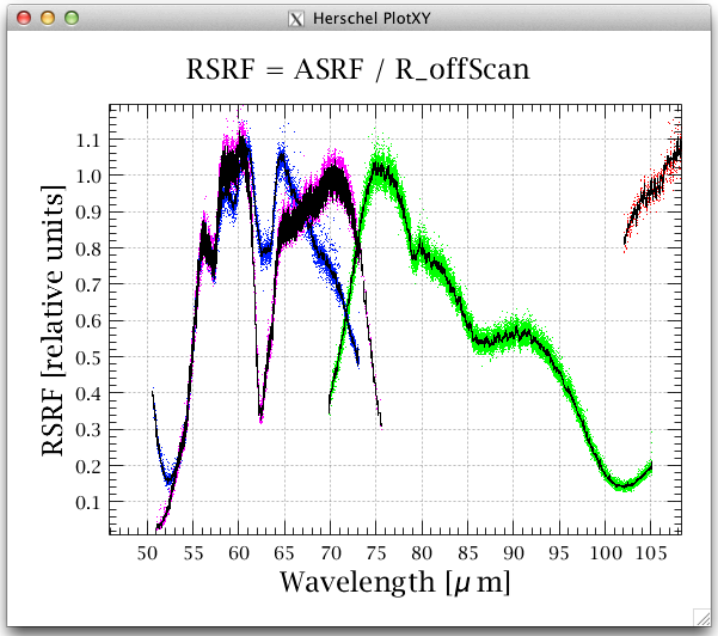


HERSCHEL SPACE OBSERVATORY

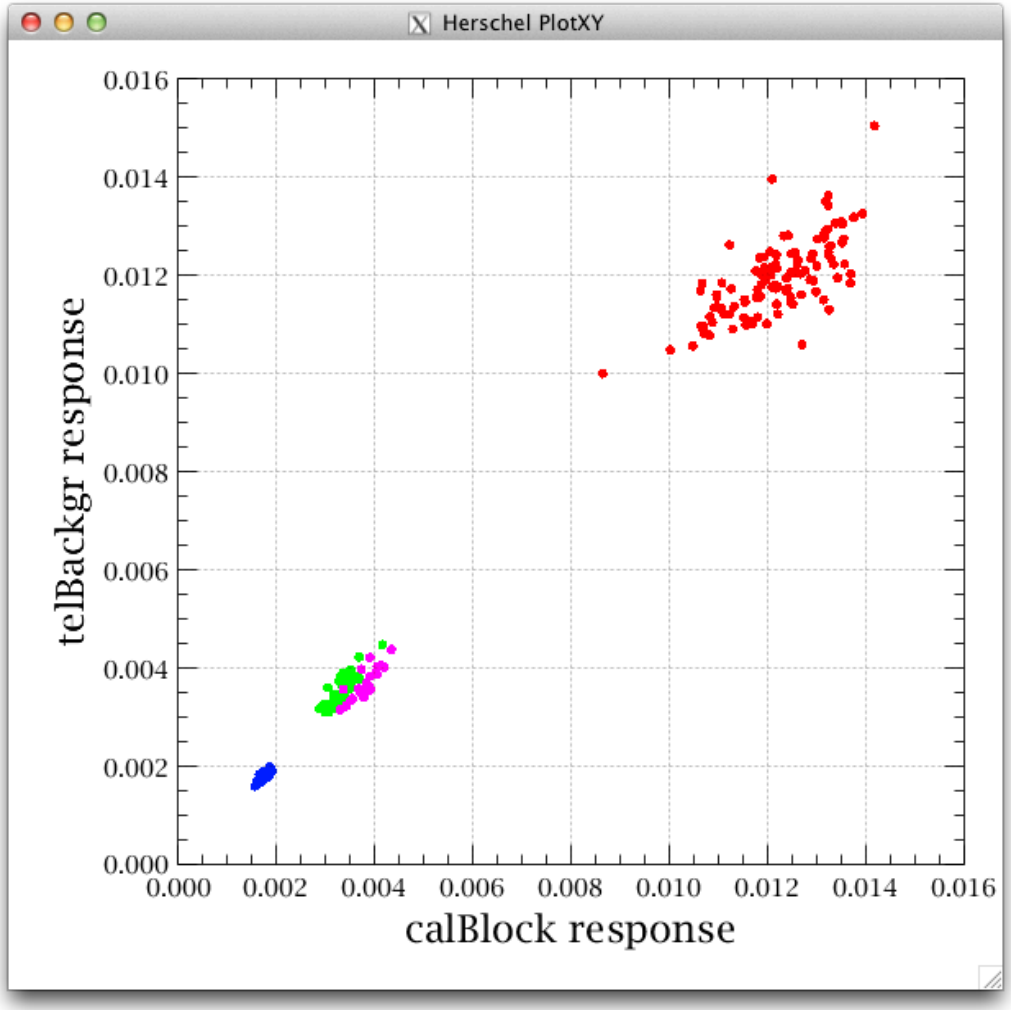
Zoom in RSRF from off-scans

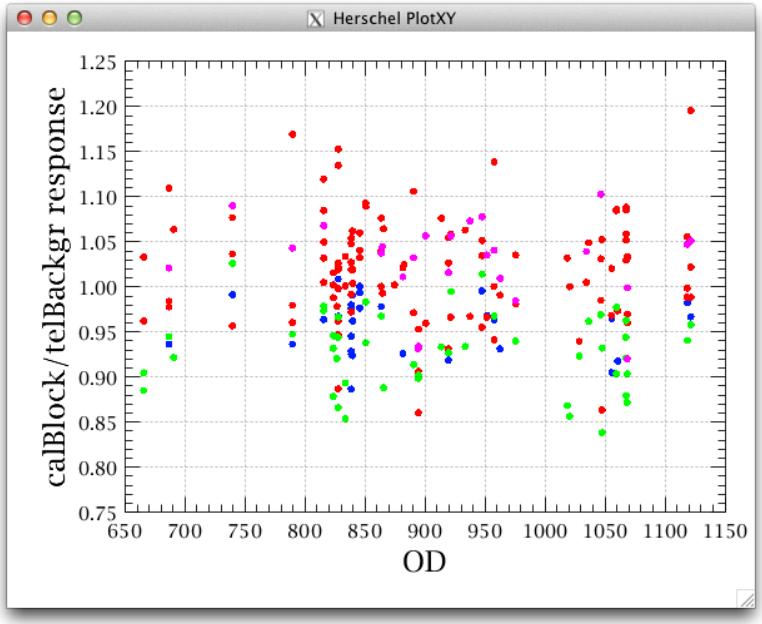




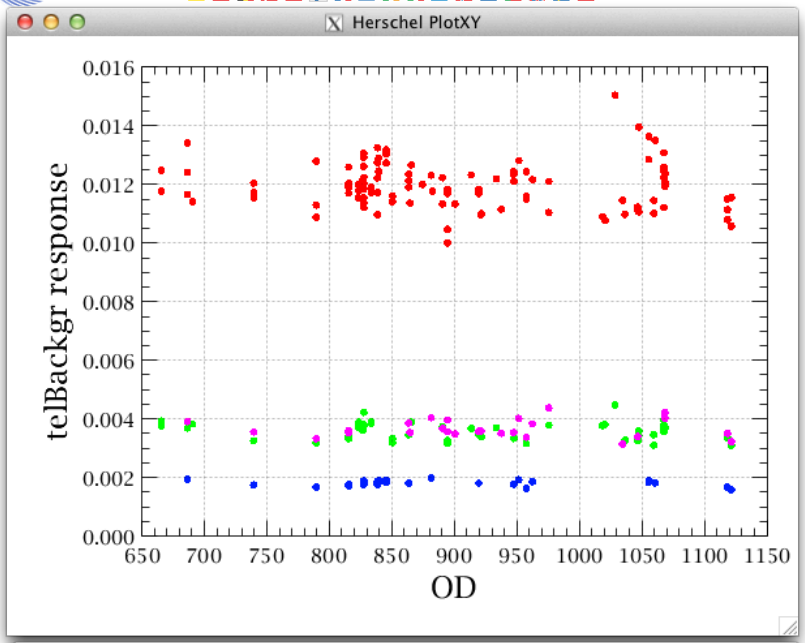


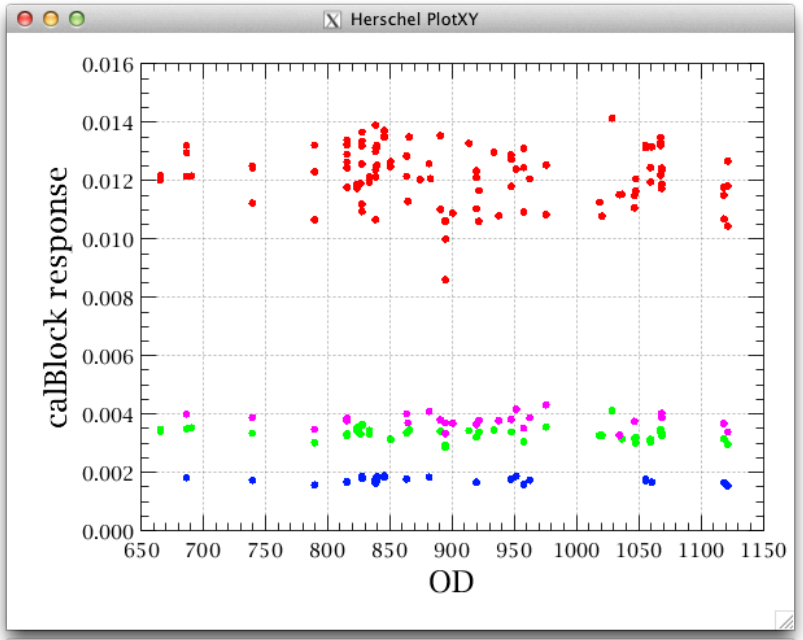
Response offScan vs. calBlock

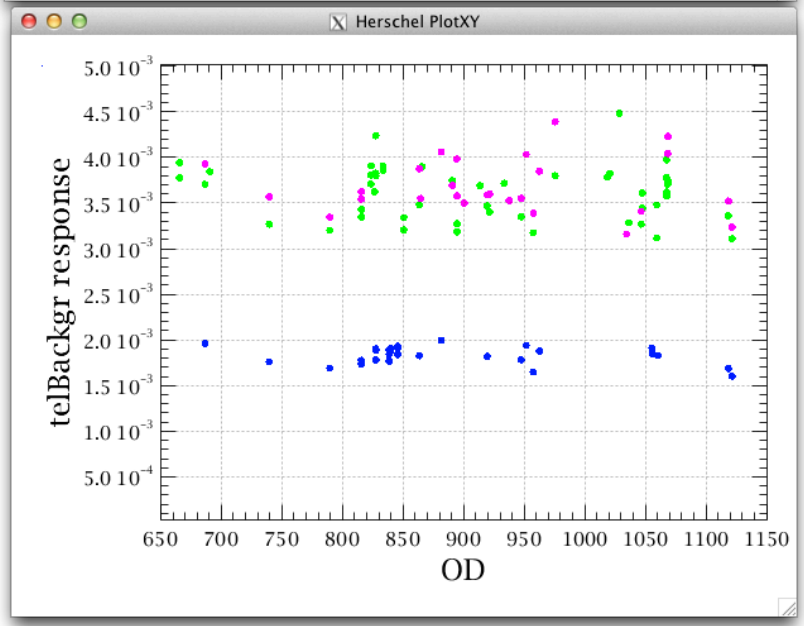


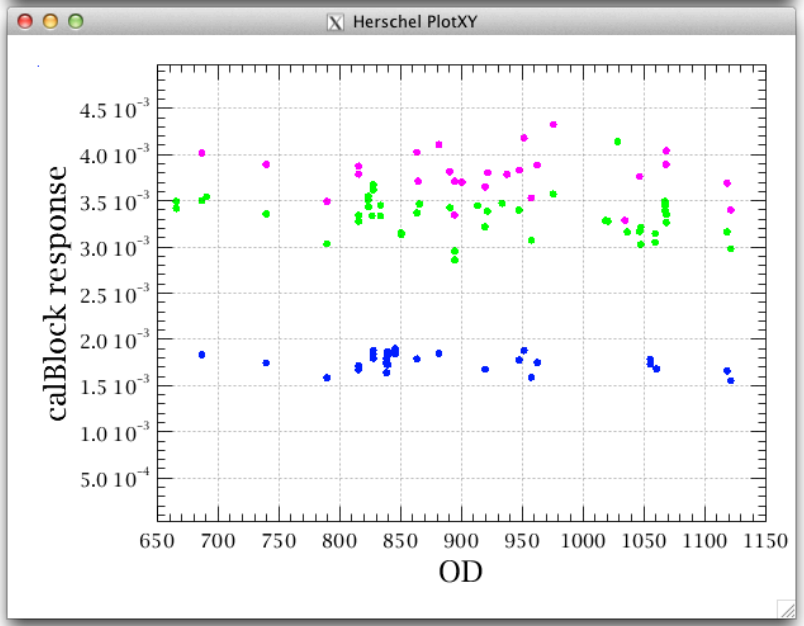


Response offScan vs. calBlock









Preliminary results

- After 70% of available off-scans reduced the ASRF & RSRF products can be inverted to a quality sufficient for comparison with RSRF in calTree v=42
- The R1 calBlock response might have some room for improvement, it shows a larger scatter than the telBackgr response, although in some cases outliers in both estimates are well correlated (solar flare events?). Due to eventual flux contamination in off-fields one should expect var(R_telBackgr) ≥ var(R_calBlock).
- The blue-band calBlock response estimates are reliable and better correlated with R_telBackgr
- Hints for yearly variation in blue response
- TBD: rebin RSRF to standard grid and comapre high-frequency part with offScan RSRF
- TBD: explain residual unchopped off-scan pattern (and try to correct by modulating the calTree RSRF).