

New VAP Data Quality Efforts Supporting MFRSR, Spectral Shortwave

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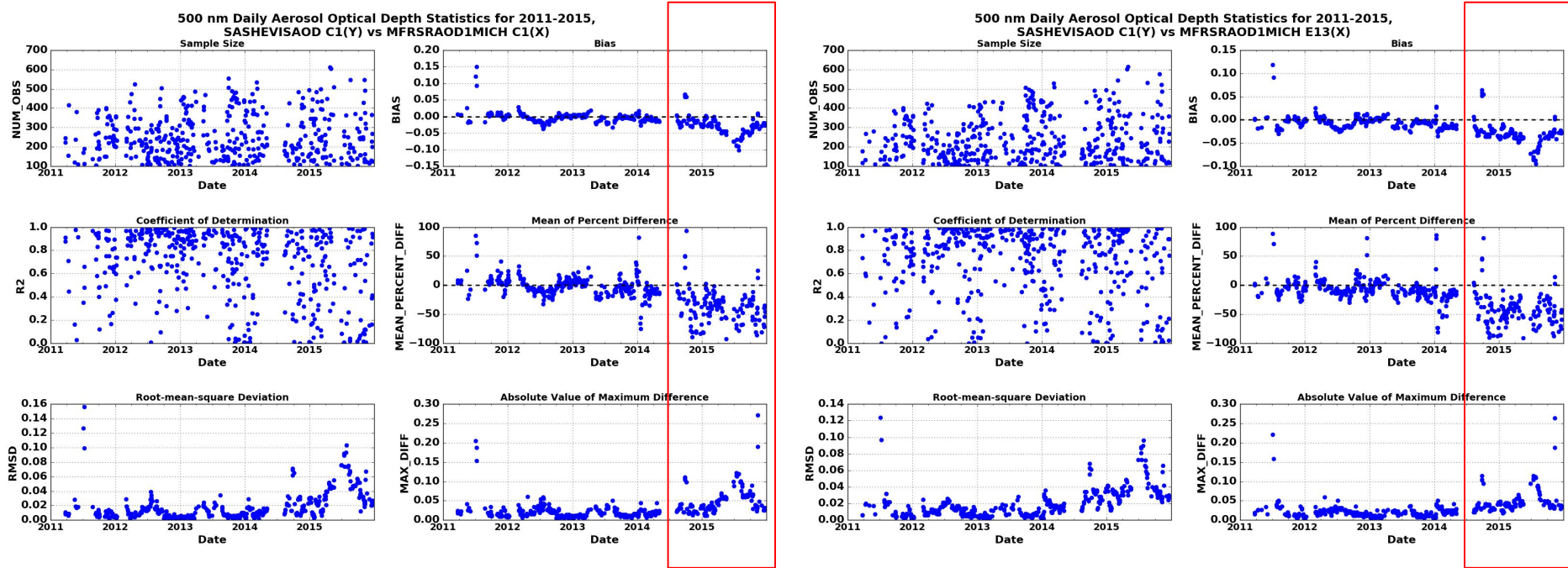


Introduction

- Previous VAP DQ efforts by the DQ Office have been focused on assessing data and metadata for new product development and initial release
- New emphasis on routine DQ Assessment of production VAPs
 - Initial focus on AOD and MFRSRCLDOD VAPs
 - Developing new Python tools and libraries for datastream comparison and visualization
- Limited resources; need automated notification for potential issues!

SASHEVISAOD C1 vs MFRSRAOD C1, E13

Aerosol Optical Depths at 500 nm, 2011-2015



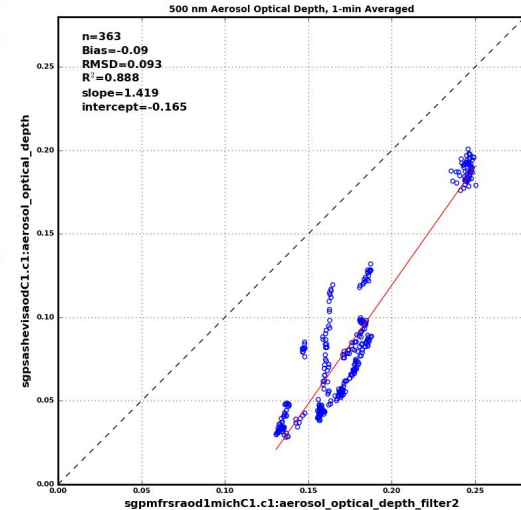
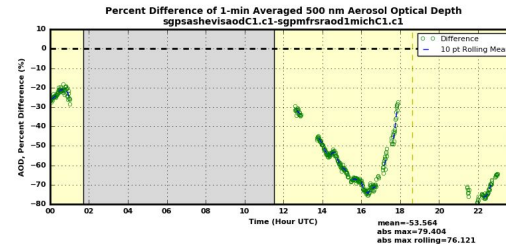
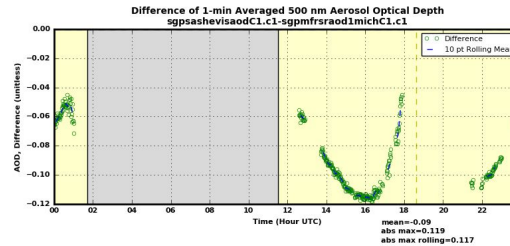
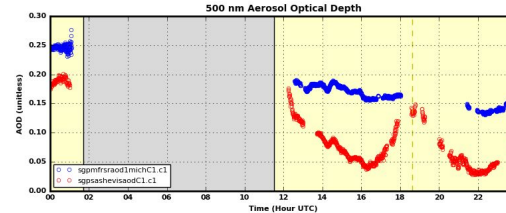
Obvious problem area, with similar trend between SASHE and both MFRSRS

SASHEVISAOD C1 vs MFRSRAOD C1

500 nm AOD for 7/24/15

VAP 500 nm Aerosol Optical Depth Comparison Plot at SGP CF for 20150724

- All data passed automated QC tests in data file
- Peak difference of ~79%
- Daily automated threshold test would easily catch this



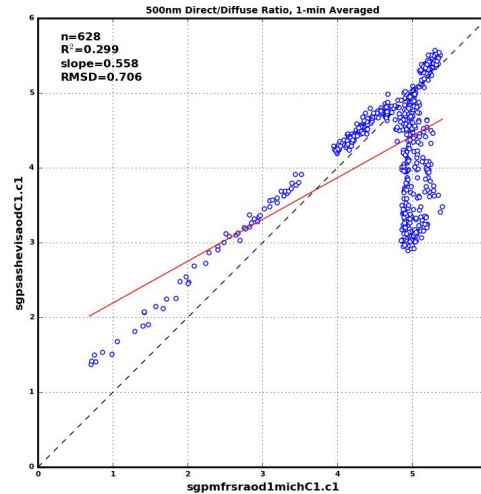
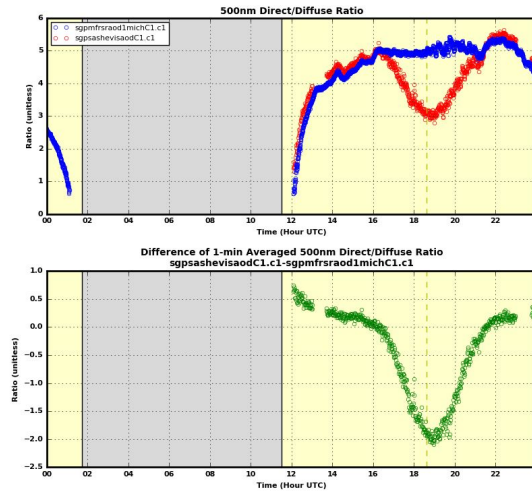
SASHEVISAOD C1 vs MFRSRAOD C1

500 nm Langley-Calibrated Direct/Diffuse Ratio for 7/24/15

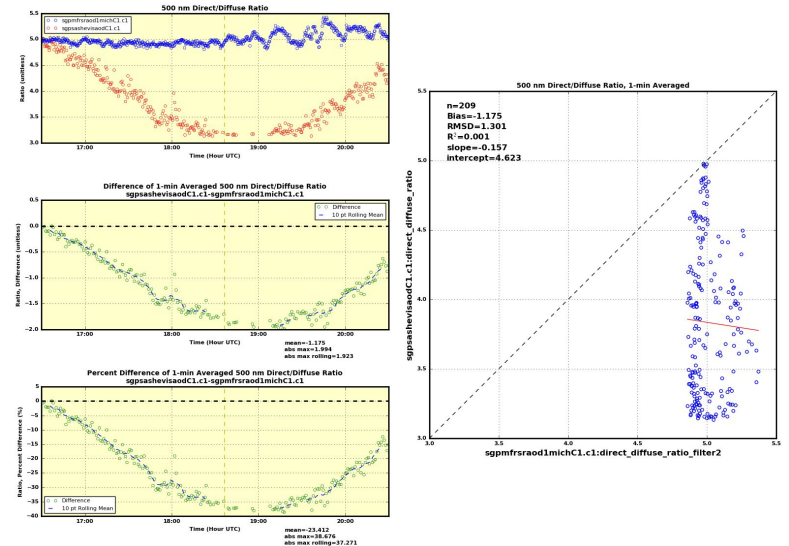
Full Day

16:30-20:30 UTC

VAP 500nm Direct/Diffuse Comparison Plot at SGP CF for 20150724

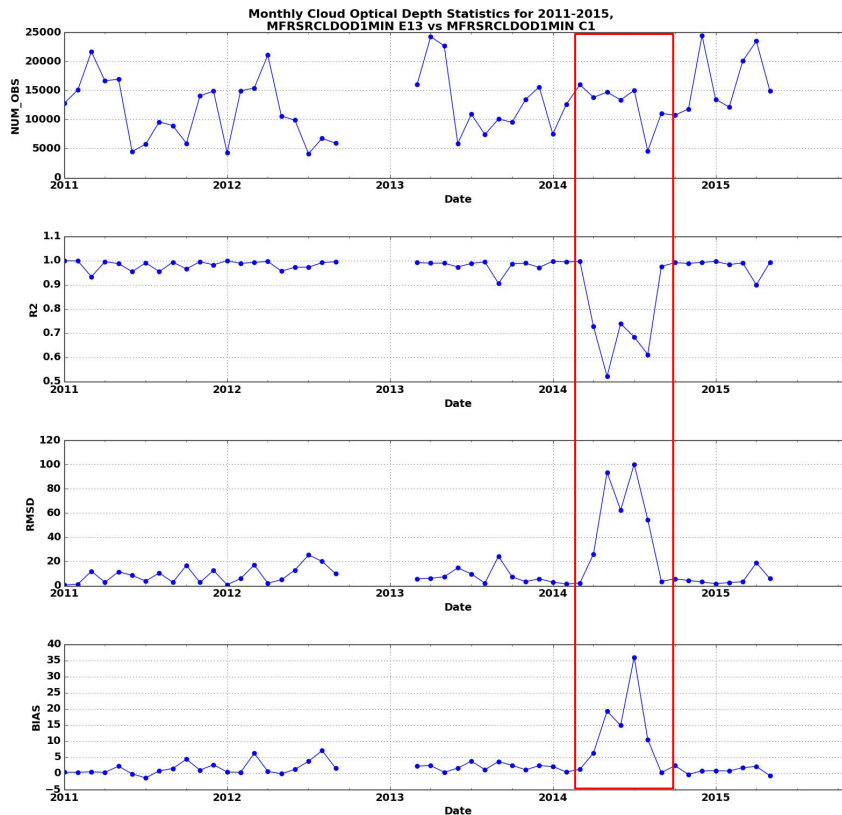


VAP 500 nm Direct/Diffuse Comparison Plot, Values < 1.5 Removed and MAD Filter Applied, 16:30-20:30 UTC Daily at SGP CF for 20150724



MFRSRCLDOD1MIN E13 vs MFRSRCLDOD C1

- Problem indicated by monthly statistics from MFRSR CLDOD comparison for 2014
- Dates impacted by MFRSR DQRs include:
 - E13:
 - 20140608-20140617
 - 20140630-20140703
 - C1:
 - 20140611-20140617
- CLDOD differences do not correlate specifically with these DQR periods
- Needs further investigation



MFRSRCLDOD1MIN E13 vs MFRSRCLDOD C1

20140606

No MFRSR DQRs Entered

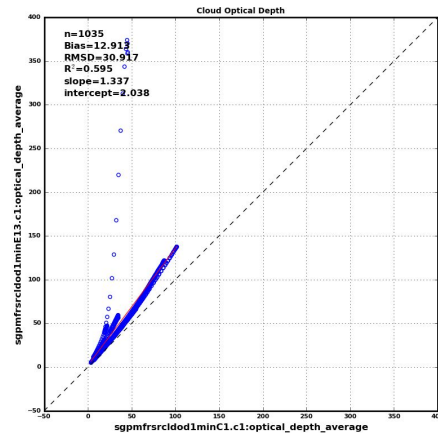
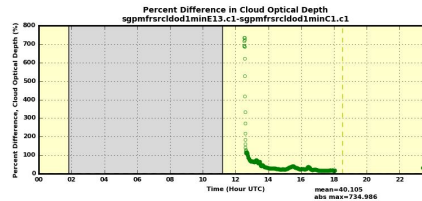
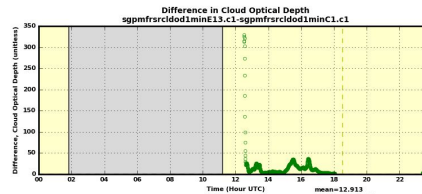
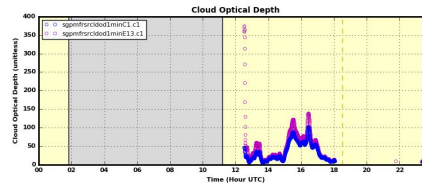
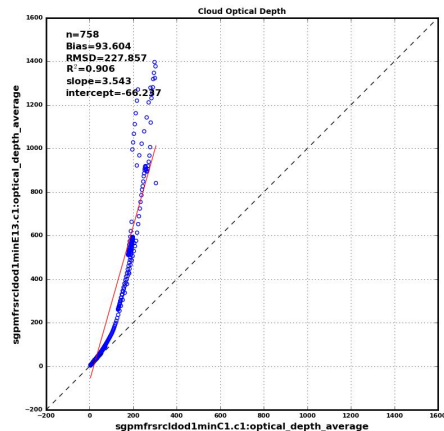
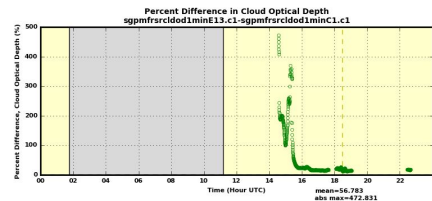
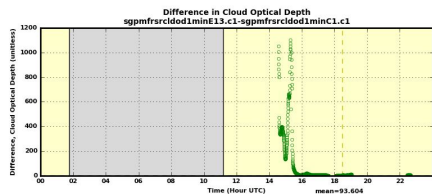
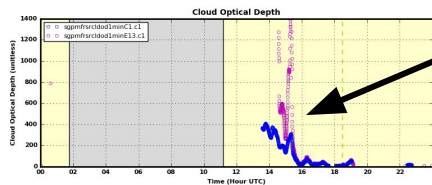
20140615

DQRs - MFRSR shadowband misalignment:

E13: 20:30-0:32 UTC

C1: 16:30-18:45 UTC

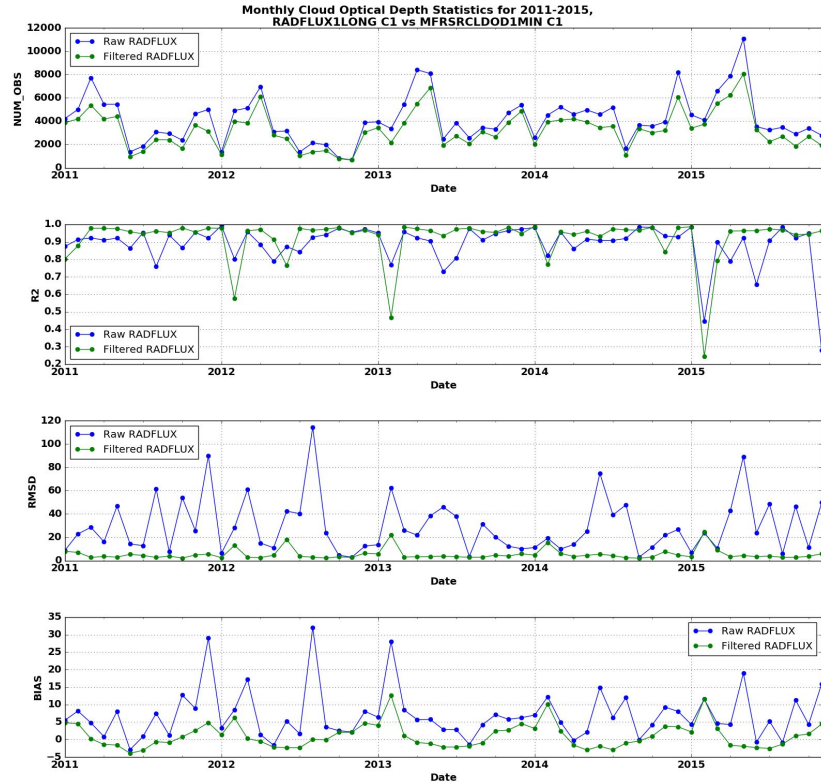
Light precipitation reported by E13 MET



RADFLUX1LONG C1 vs MFRSRCLDOD1MIN C1

Monthly CLDOD Statistics, 2011-2015

- Raw RADFLUX CLDOD values (blue)
- Filtered RADFLUX CLDOD values (green) are filtered by `cloudfraction_shortwave_status = 3`
 - Sets cloud fraction to 1.0 when average diffuse cloud effect is < 0.4
 - May be a good filtering criterion when comparing these datasets



Future Plans

- Finish development of datastream comparison tools
 - Generate automated notifications for differences exceeding statistical thresholds
 - Implement Alexandrov et al. (2007) MFRSR shading detection algorithm?
- Review data from 2011-2015 at the SGP CF
 - Document problems (DQPRs, DQRs)
 - Investigate impacts of typical MFRSR problems on CLDOD and AOD
 - Investigate Langleys
 - Track head IDs for MFRSRs
 - Refine statistical thresholds
- Implement CIMEL into comparisons?
- Other suggestions?