

Cross Comparison of SNPP and J1/N20 VIIRS and Aqua MODIS

Summary from LDOPE's analysis of L1 data generated by Land SIPS in the science tests run using the latest calibration algorithm and LUTs delivered by the NASA VCST. Science test generated an year of global Level-1 (L1) and Level-2 (L2) land surface reflectance swath and Level-3 (L3) CMG products for year 2019.

VIIRS C1 L1B and Land Processing

- C1 SNPP VIIRS L1B (AS 5110 of LAADS)
 - Generated using calibration algorithm and LUT delivered by NASA VCST
- C1 SNPP VIIRS Land (AS 5000 of LAADS)
 - Uses L1 SDR generated using the operational IDPS calibration algorithm and LUT provided by NASA
 - TOA values in L1 SDR (AS 5000) and C1 L1B (AS 5110) are nearly identical
- J1 VIIRS L1B
 - C1 (AS 3194): Generated since start of the mission using NASA VCST delivered calibration algorithm and LUTs
 - Early mission period used pre-launch LUT and later post-launch LUTs
 - C2 reprocessing (AS 5200) using the best of algorithm and LUT completed in Aug 2019
 - Significant difference between C1 SNPP L1B and C2 J1 L1B observed, and confirmed by NASA VCST

VIIRS C2 L1B and Land Reprocessing

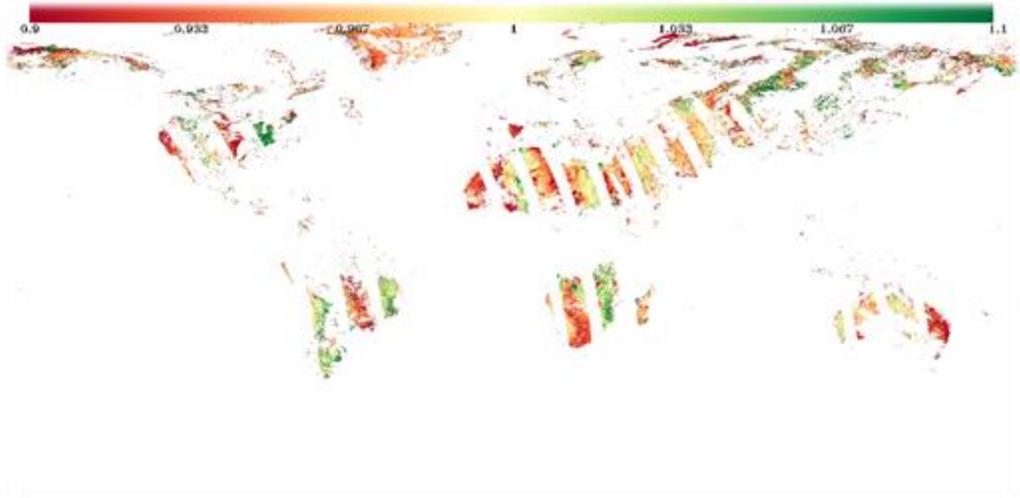
- C2 reprocessing at Land SIPS will use VCST's latest updates to calibration algorithm and LUT
 - C2 SNPP VIIRS L1 – reprocessing in progress
 - C2.1 J1/N20 VIIRS L1 – reprocessing to start in Dec/Jan.
- Difference in L1 compared to prior collection version (C1 vs C2 SNPP, C2 vs C2.1 J1/N20) insignificant, < 0.5% for most bands. (results not presented)
- Evaluation of C2 L1 products from science tests revealed significant difference between SNPP, J1 and MODIS. (results in following slides)

Cross comparison of L1s SNPP and J1 VIIRS and Aqua MODIS

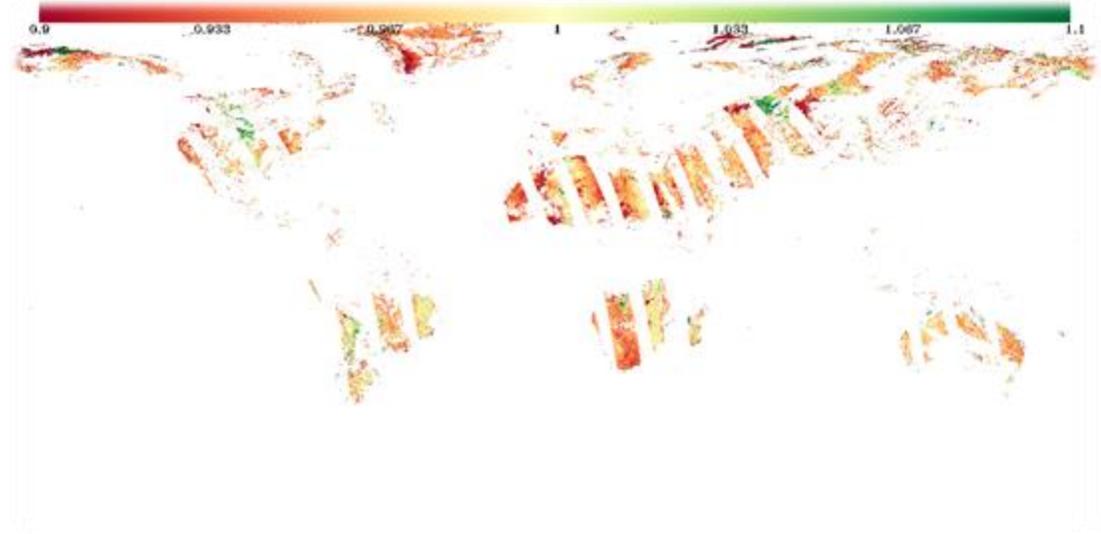
- Science test processed an year of global data from year 2019 generating
 - L1B and Geolocation products generated using the latest C2 calibration LUT and C2 geolocation code and LUT
 - L2 LSR swath and LSR global CMG products generated using the C2 LSR stream of PGEs
- Analysis
 - BRDF Corrected LSR CMG product used in this anal
 - Time series of daily average ratio of reflectance from BELMANIP sites

VNP09CMG (C2) vs VJ109CMG (C2.1)

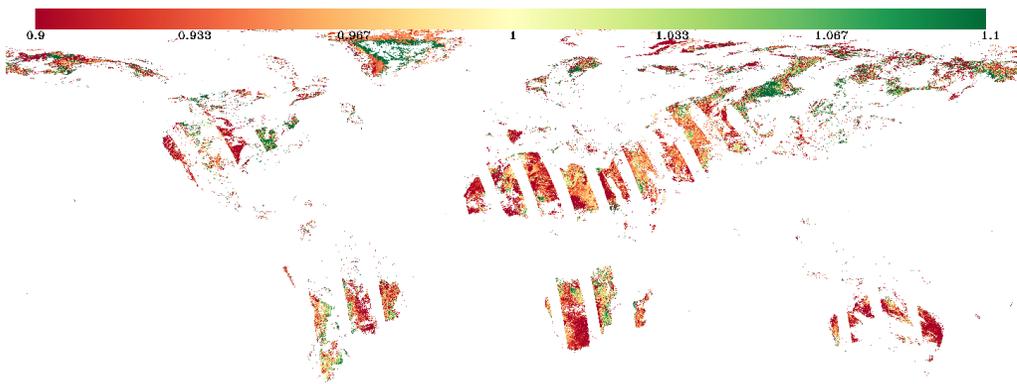
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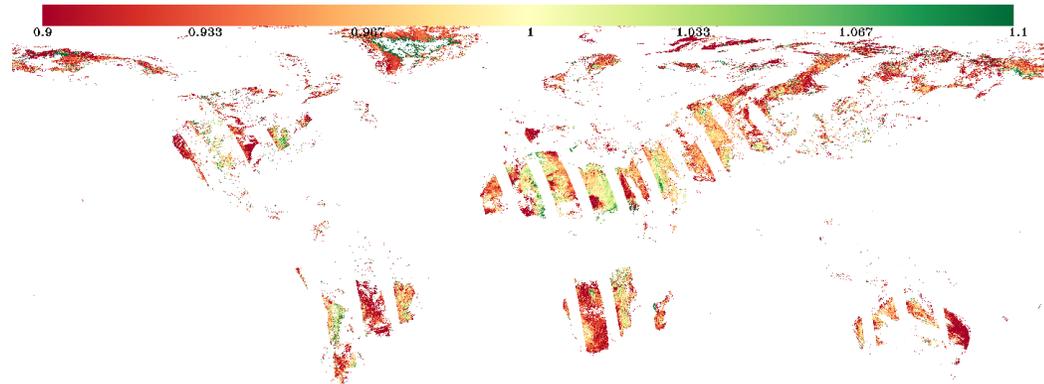
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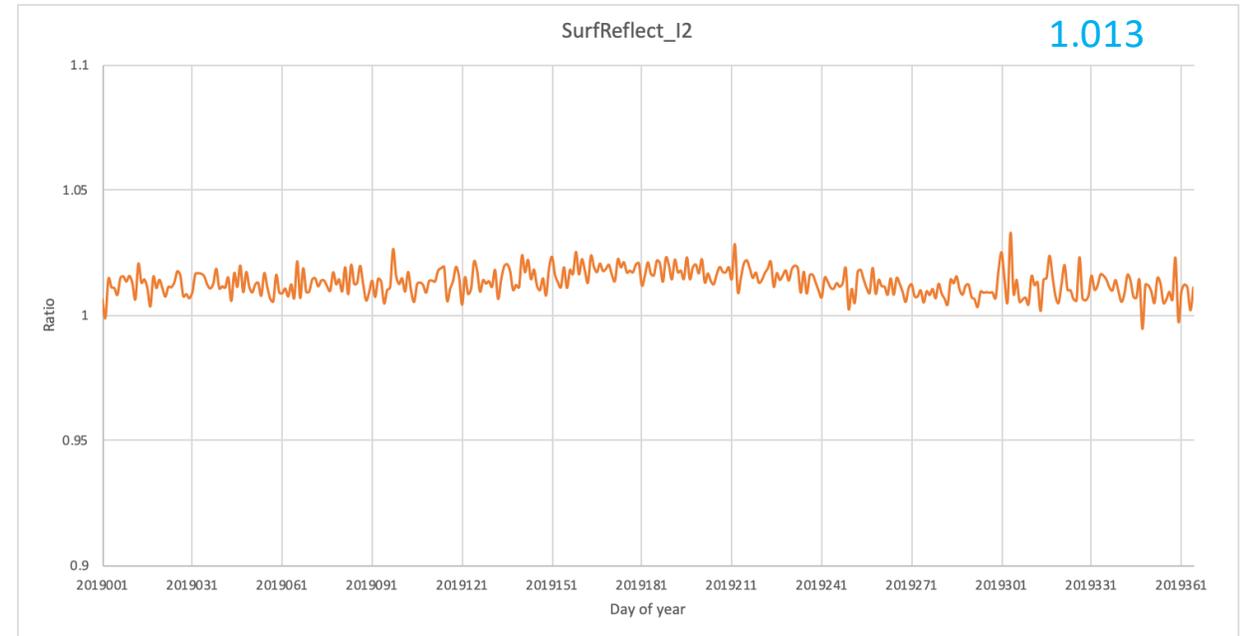
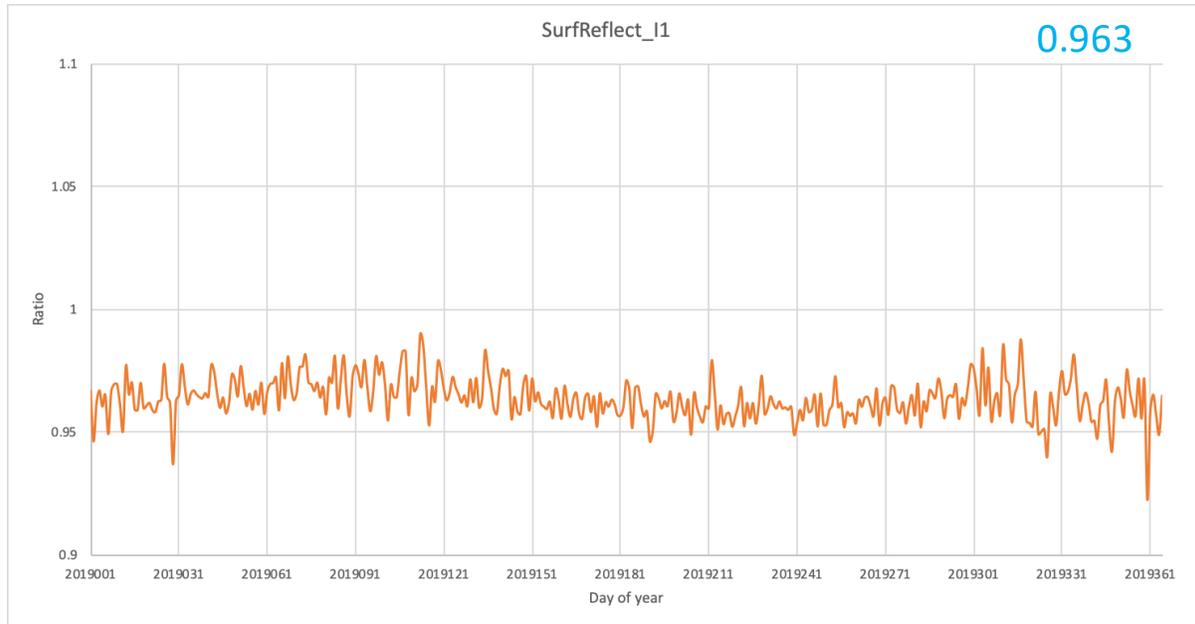
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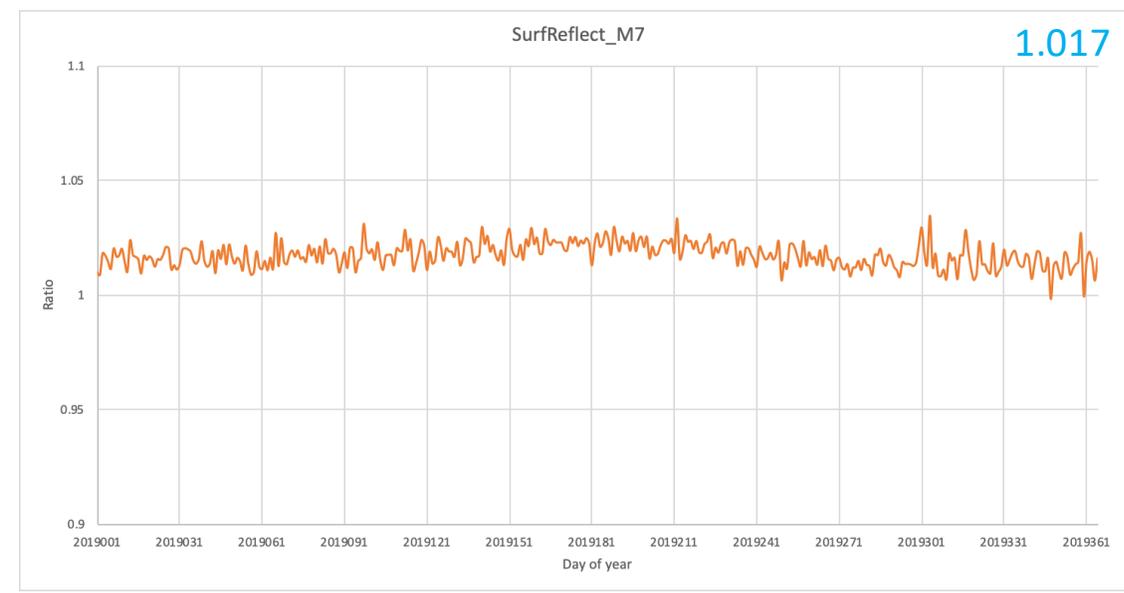
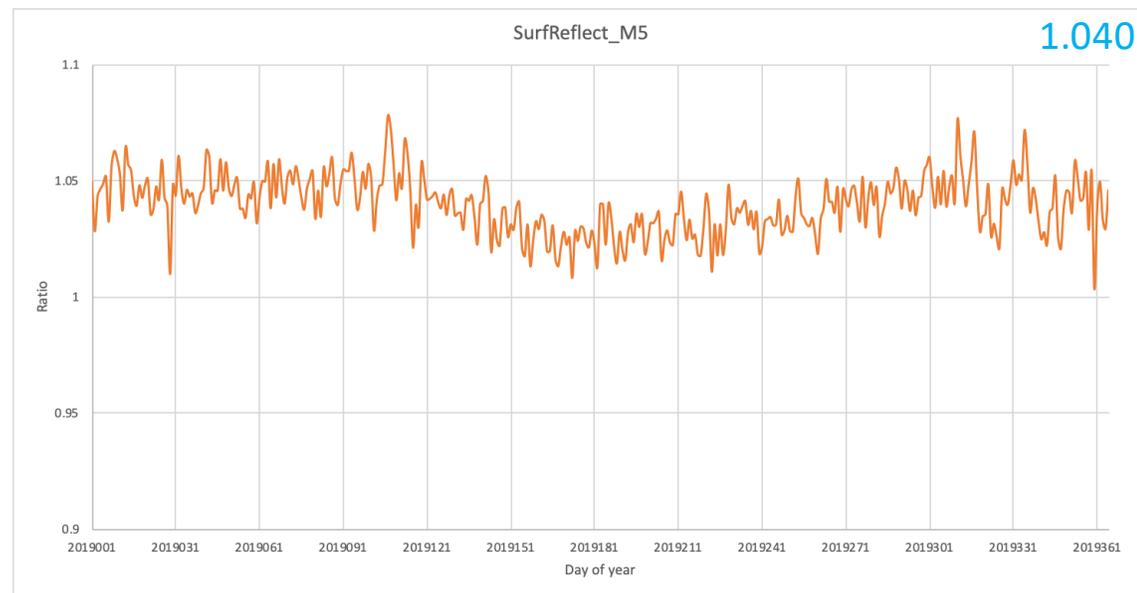
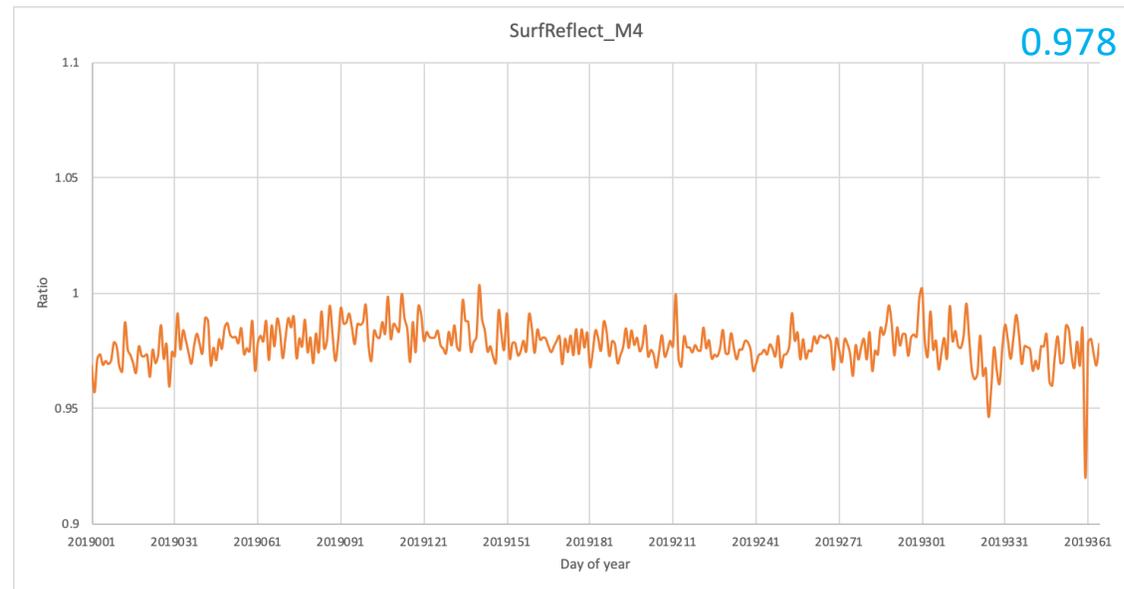
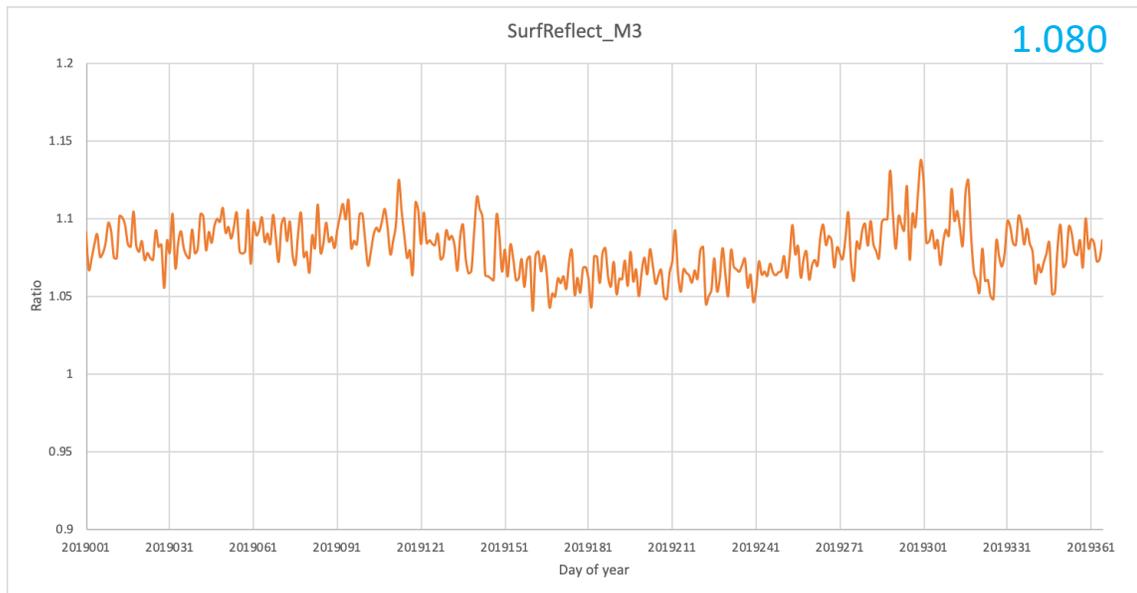
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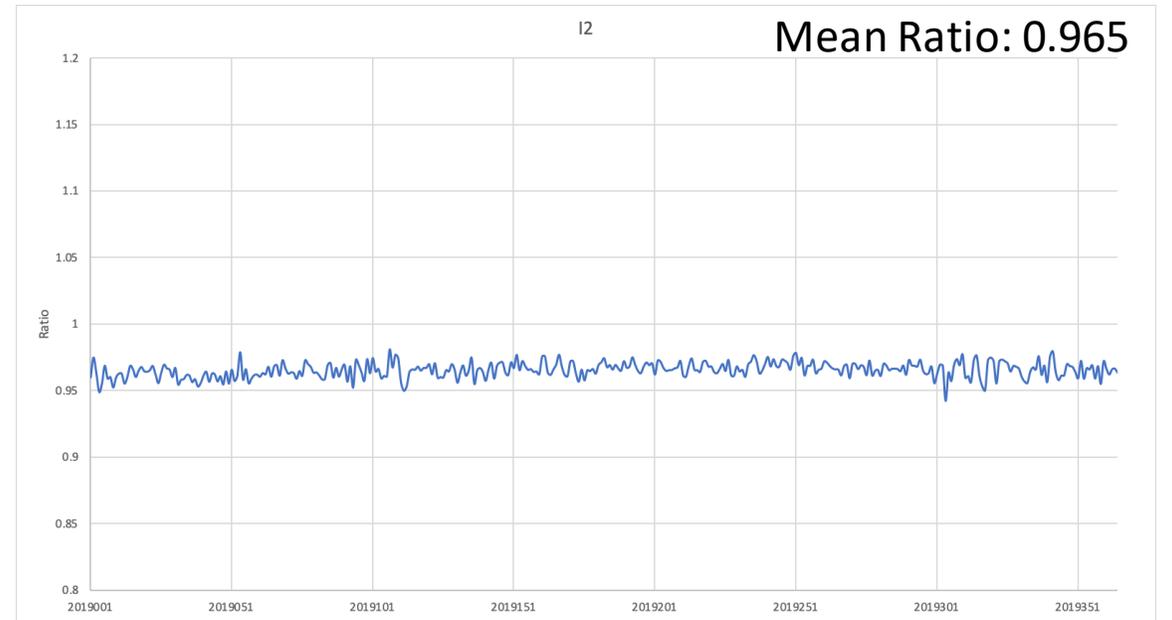
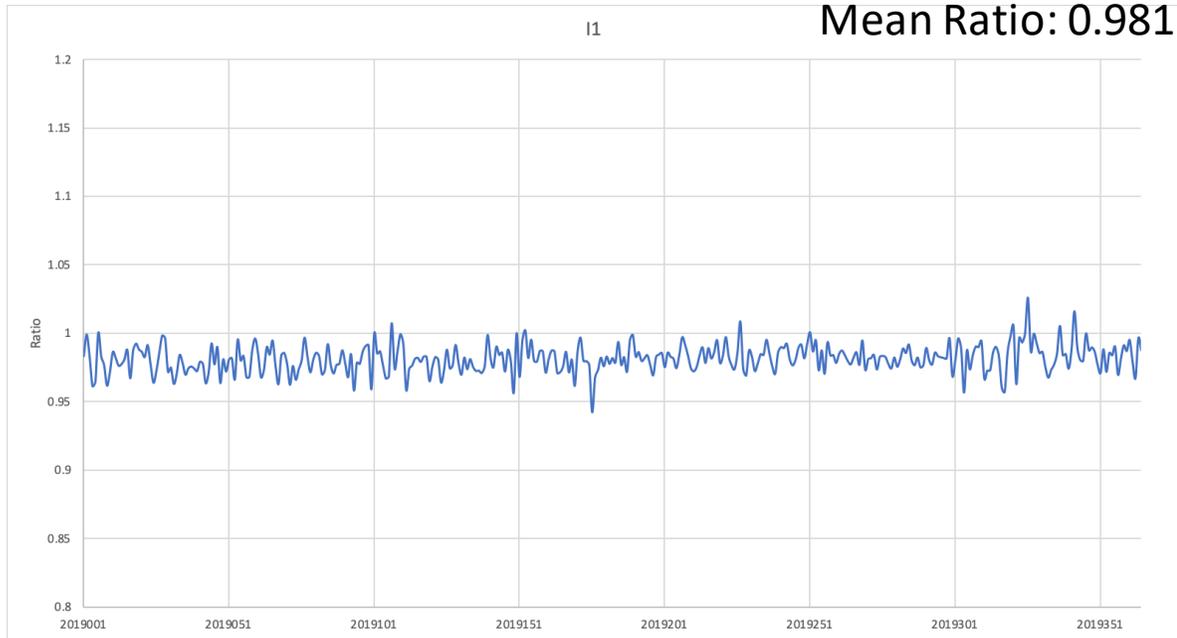
VNP09CMG (C2) vs MYD09CMG (C6)



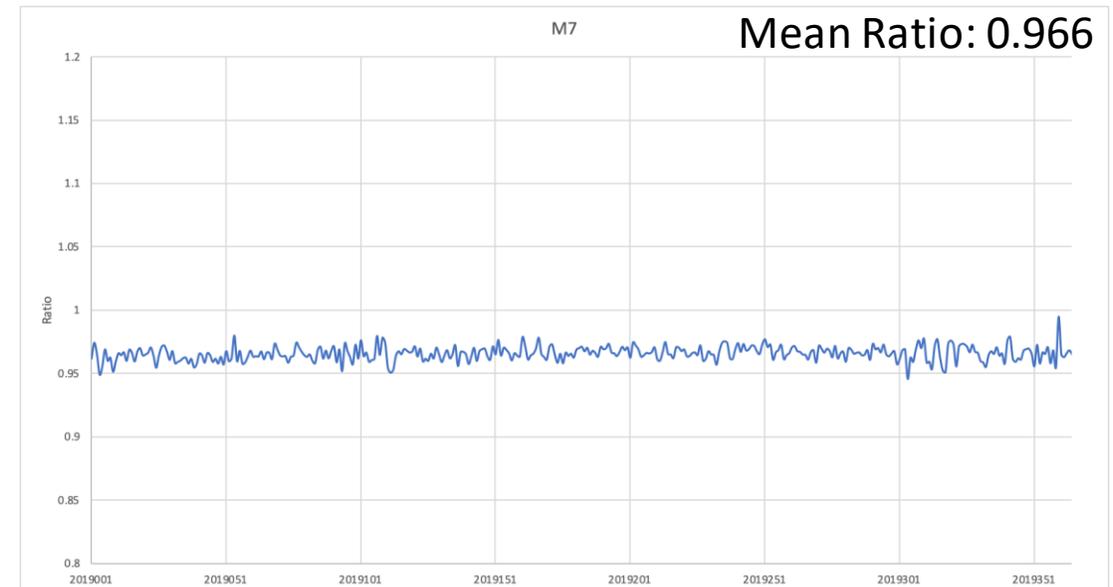
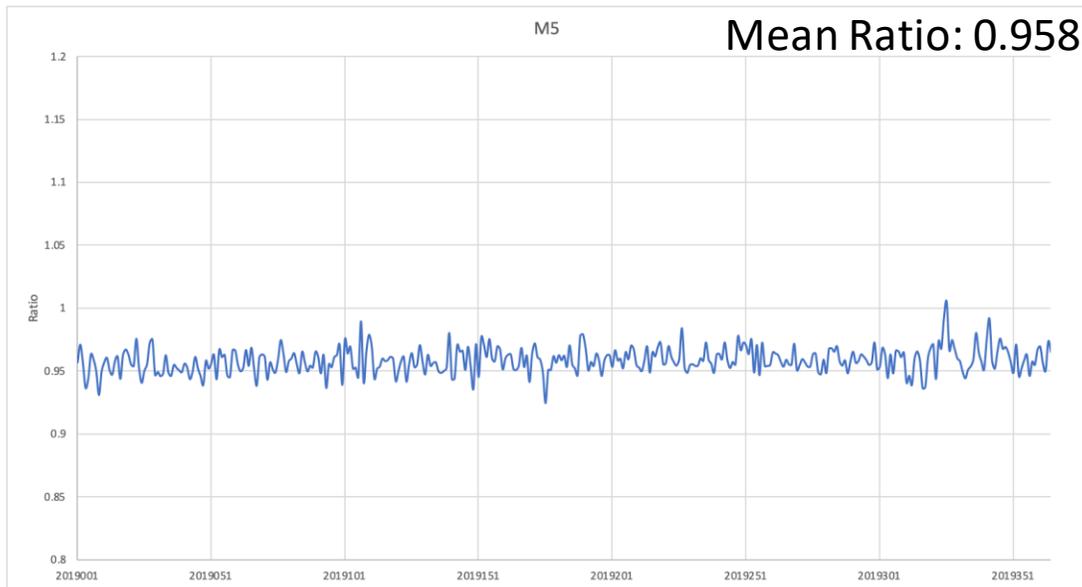
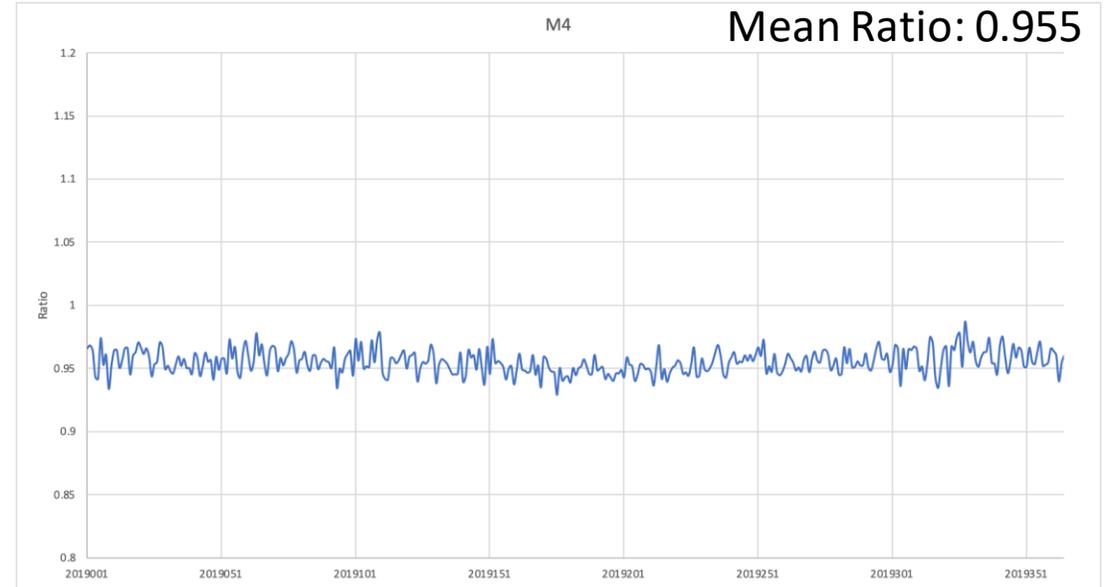
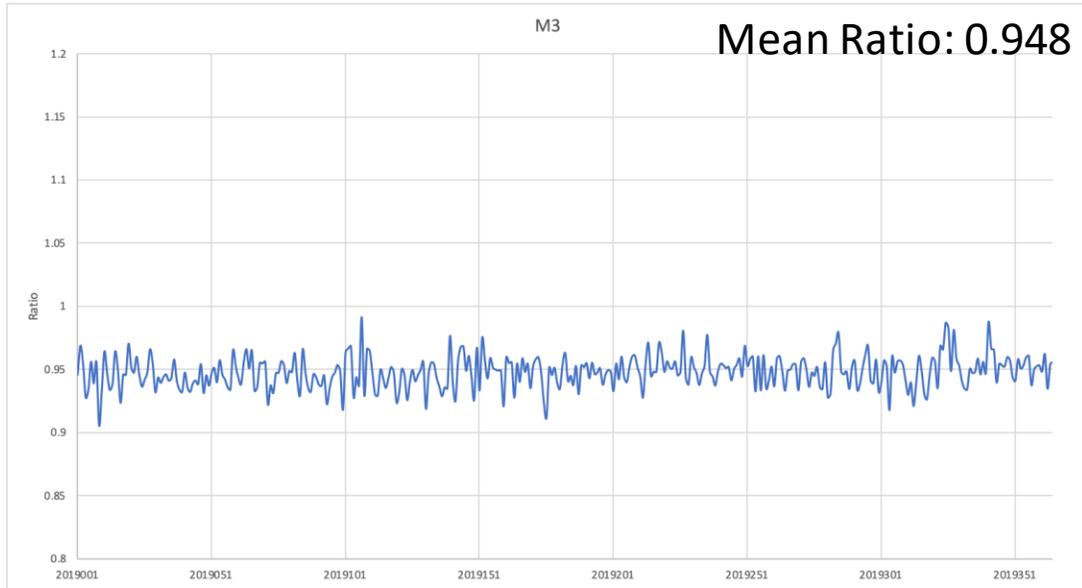
VNP09CMG (C2) vs MYD09CMG (C6)



VNP09CMG (C2) vs VJ109CMG (C2.1)



VNP09CMG (C2) vs VJ109CMG (C2.1)



Summary

- Difference in VIIRS L1 (SNPP and J1) from C2 changes to calibration is insignificant
- Observed difference in reflectance between SNPP and J1 in the range of 2 – 6%
- Differences are band dependent.