



LIME: Comparison with PROBA-V dataset

Stefan Adriaensen (VITO), Africa Baretto (UVa), Agnieszka Bialek (NPL), Marc Bouvet (ESA), Javier Gatón Herguedas (UVa), Chris Maclellan (NPL), Carlos Toledano (UVa), Pieter De Vis (NPL), Emma Woolliams (NPL)

Overview



- Overview of PROBA-V
 - Lifetime
 - Lunar Dataset
- Comparison of the PROBA-V with LIME model
- Conclusion

PROVA-V lifetime



- Operational :
 - From 11/2013 (2.5y intended)
 - Daily global coverage
 - Calibration Scenes (2 lunar acquisitions per month)
- Extended limited operational
 - From 07/2020
 - imaging over Europe and Africa only
 - Calibration Scenes
 - increasing the number of Lunar acquisition
 - Include cycles (-90.0 -> 90.0 phase angle)
- Experimental
 - From 11/2021
 - Dark current and RadCalNet (Railroad and Gobabeb) : limited amount of acquisitions
 - Due to power limitations and temperature control : currently only moon acquisitions

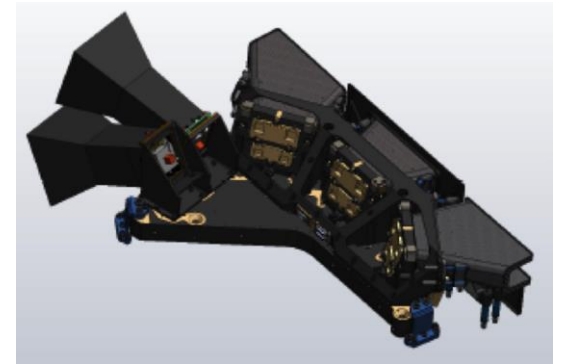
PROBA-V lunar dataset



PROBA-V lunar irradiance dataset has :

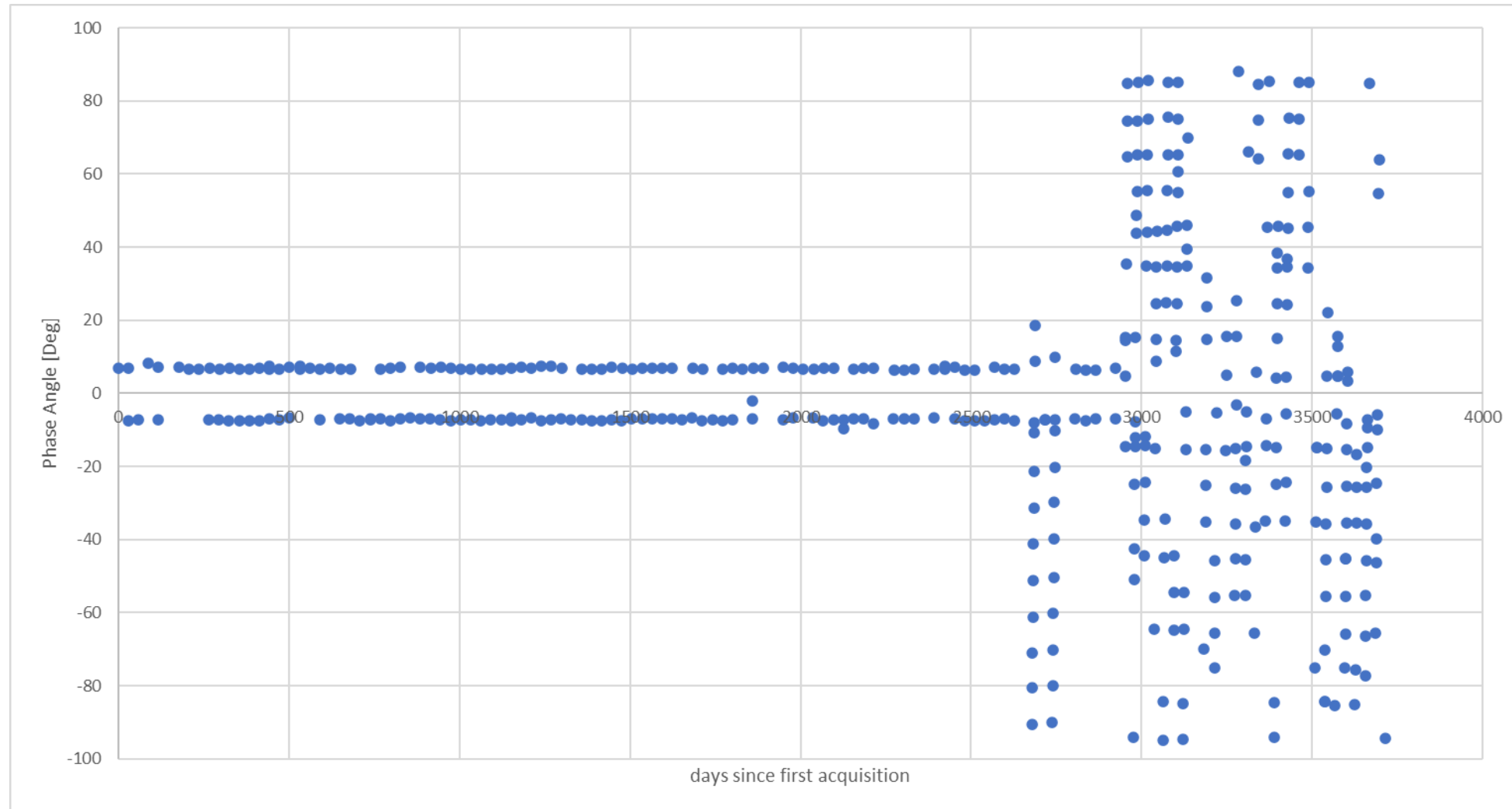
- 10+ years data
- Only bimonthly acquisitions (+/- 7deg) operational
- In decommissioning since November 2021 (experimental)
- Currently 565 acquisitions

PROBA-V has 3 cameras, only center has taken moon acquisitions

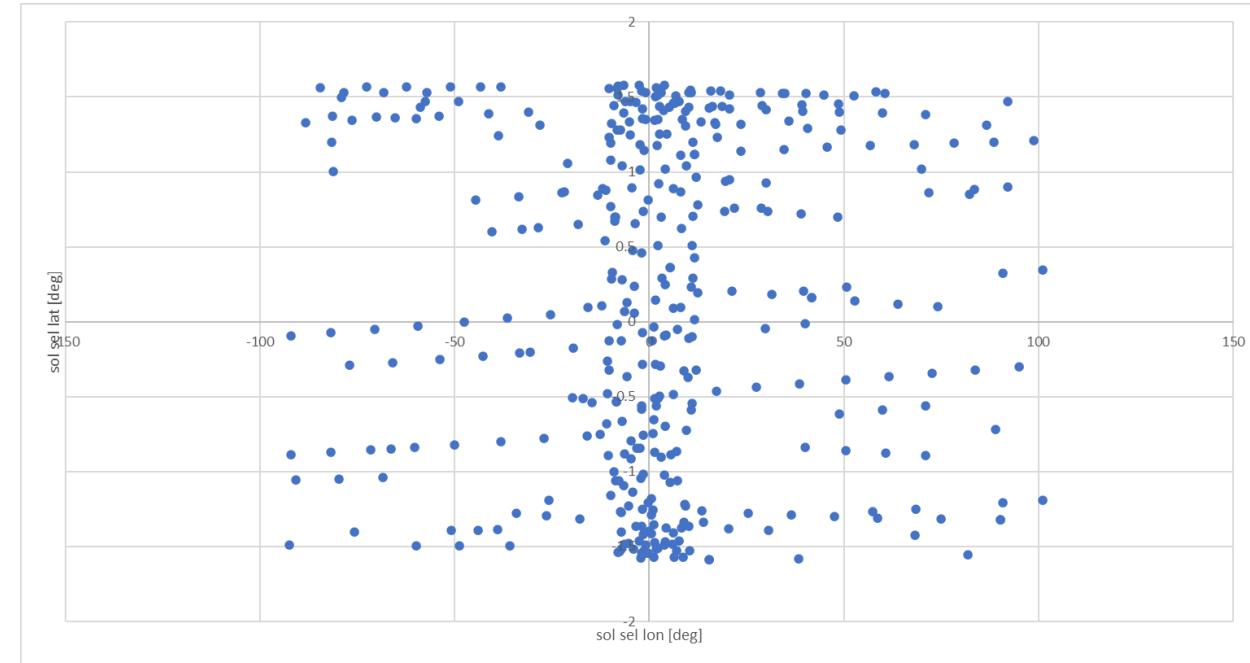
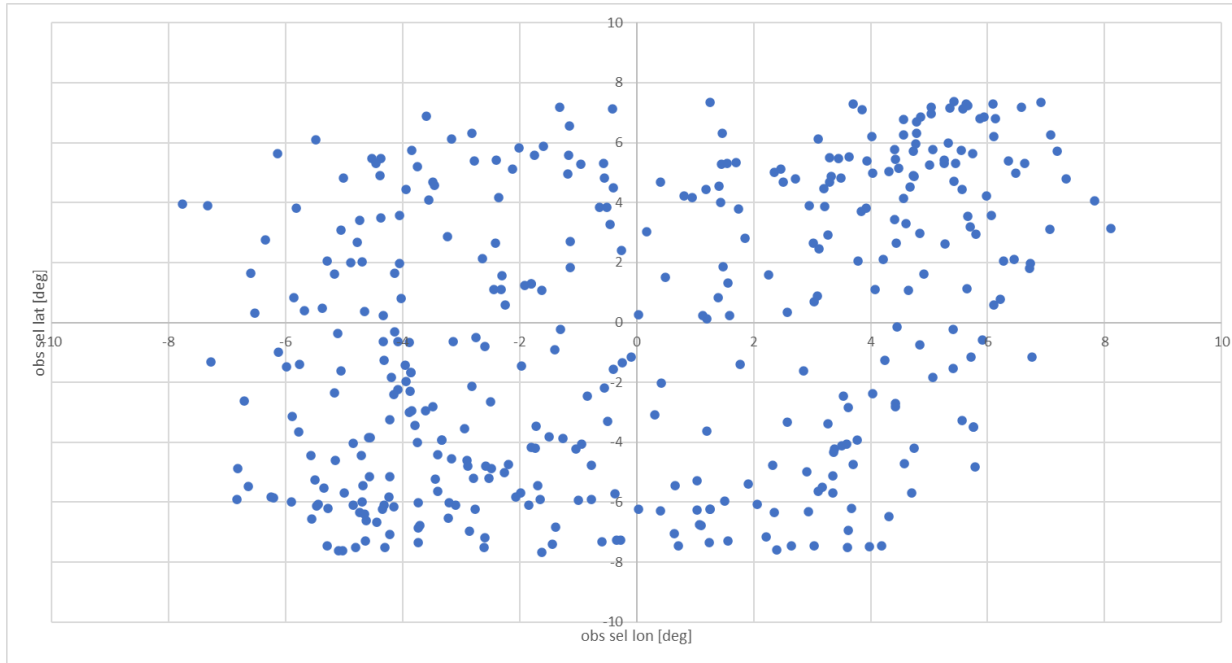


- 3 Cameras
- 2 focal planes:
 - VNIR with 3 bands
 - SWIR with 1 band but staggered strips

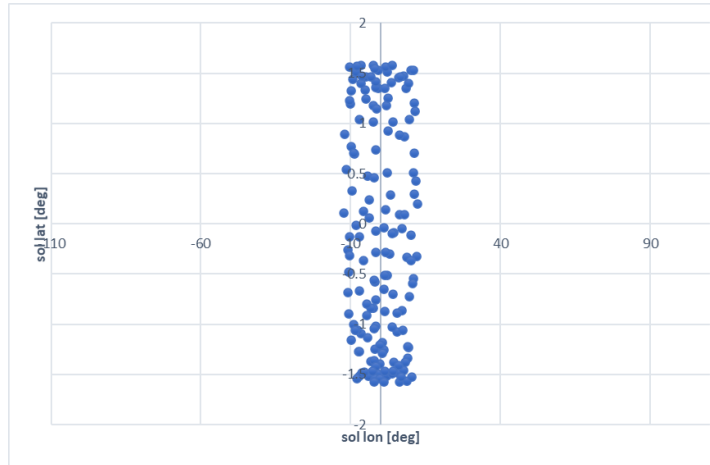
Phase Angles



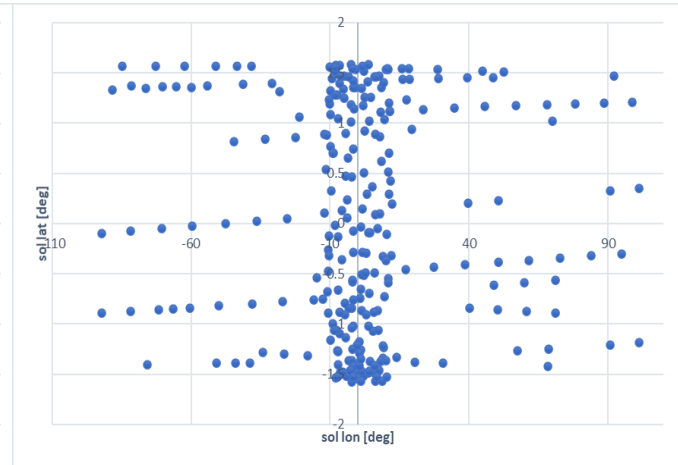
Libration coverage



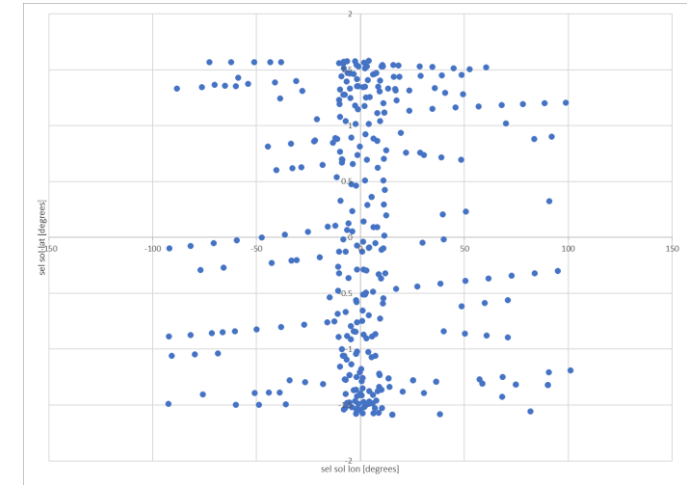
Libration coverage



7/2020

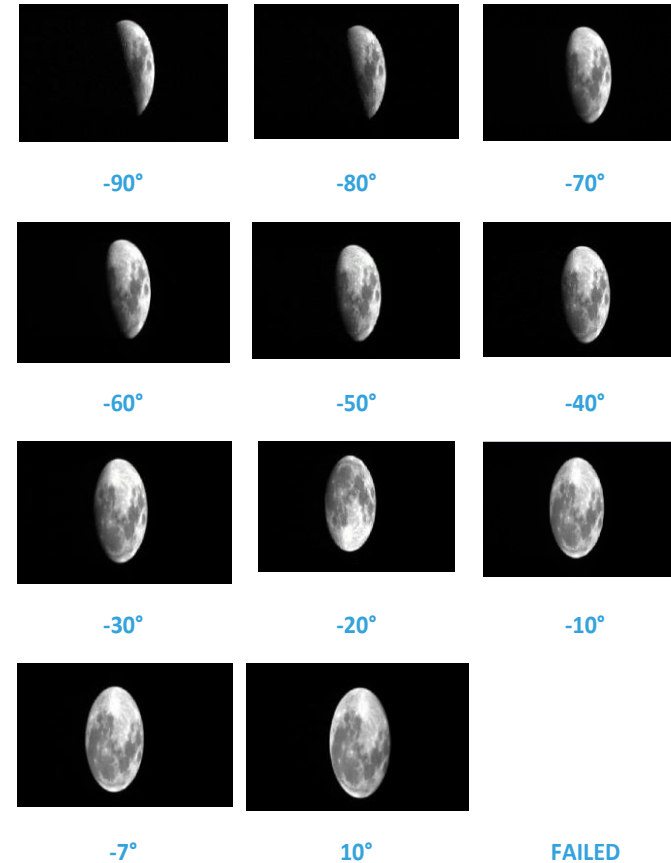
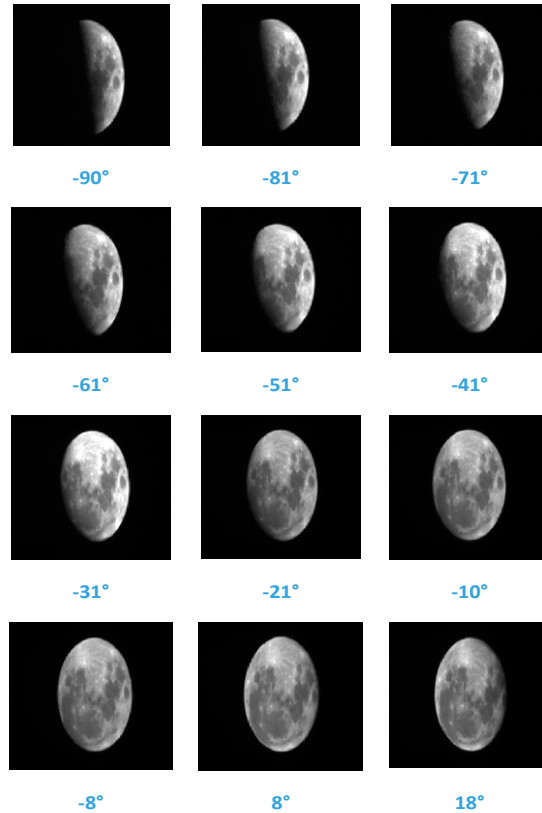


7/2022

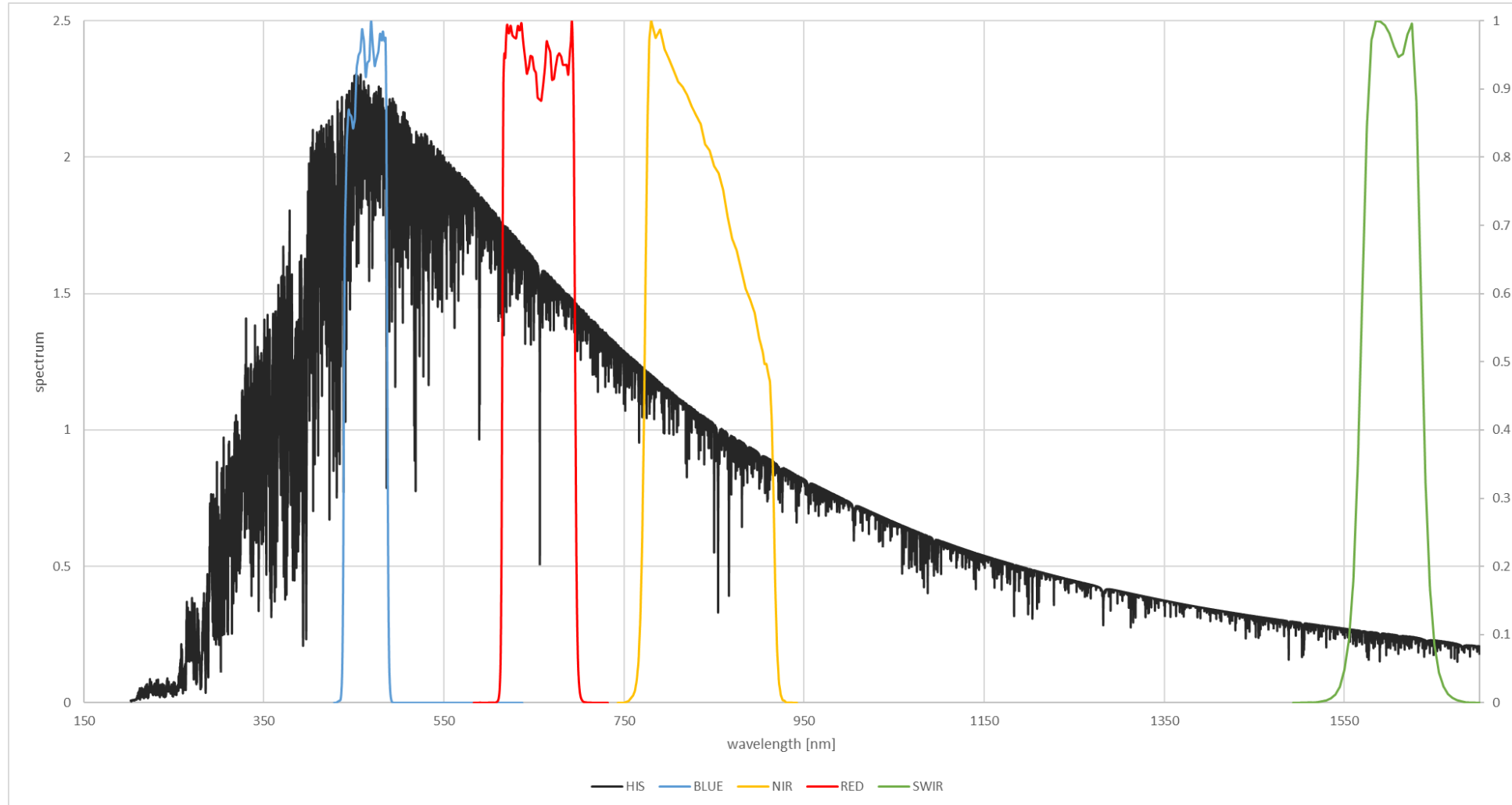


3/2023

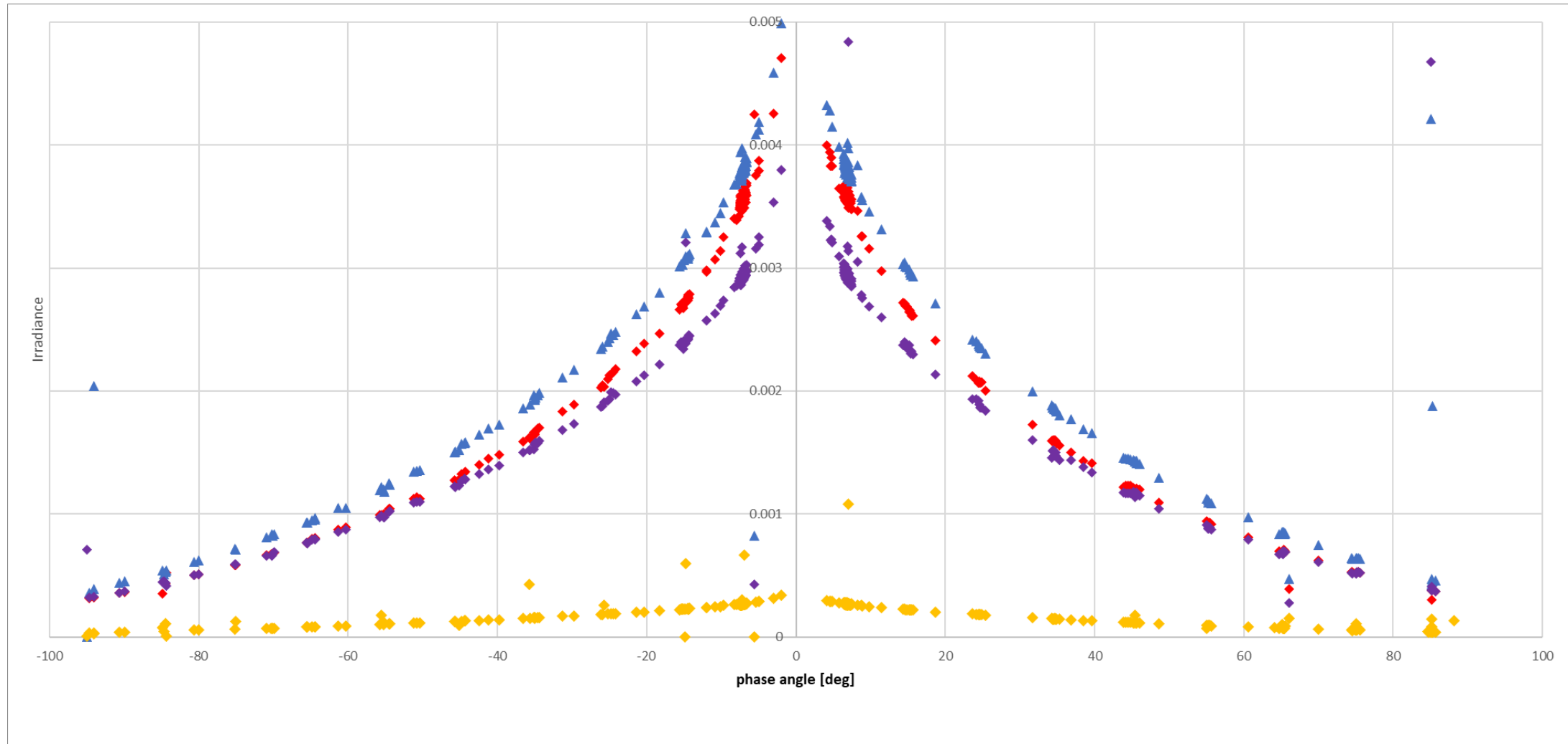
PROBA-V dataset



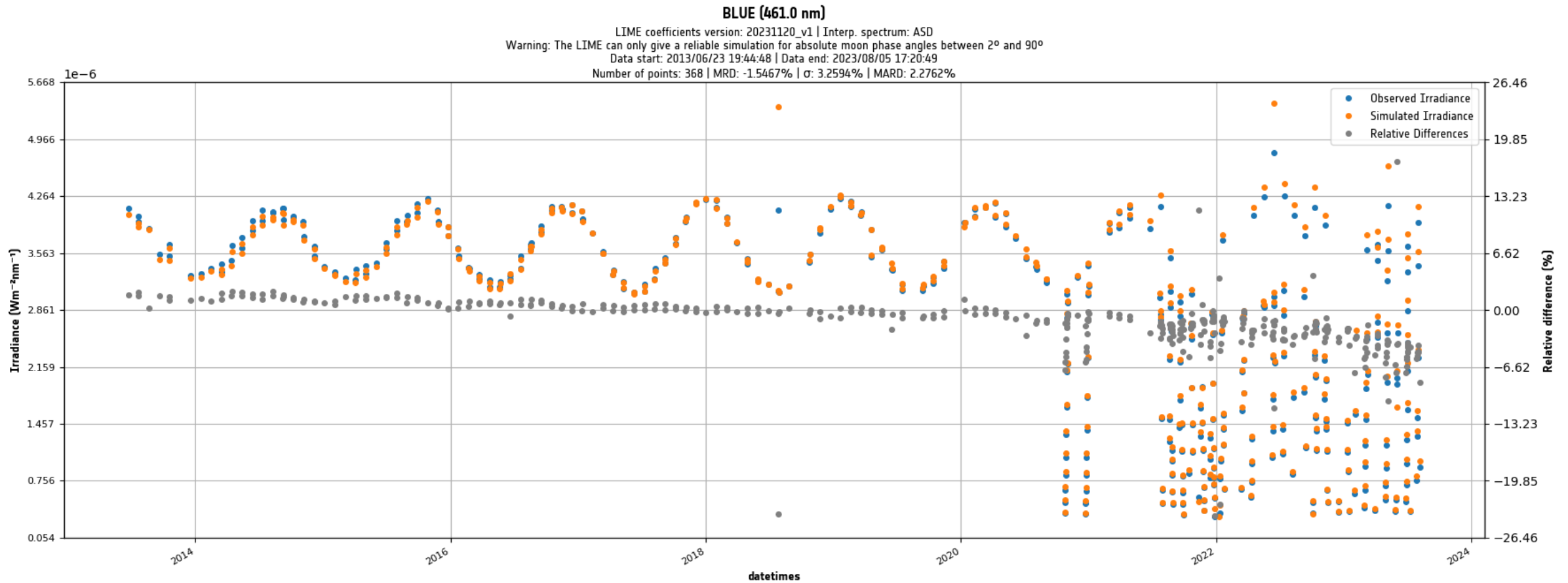
Sensor Response



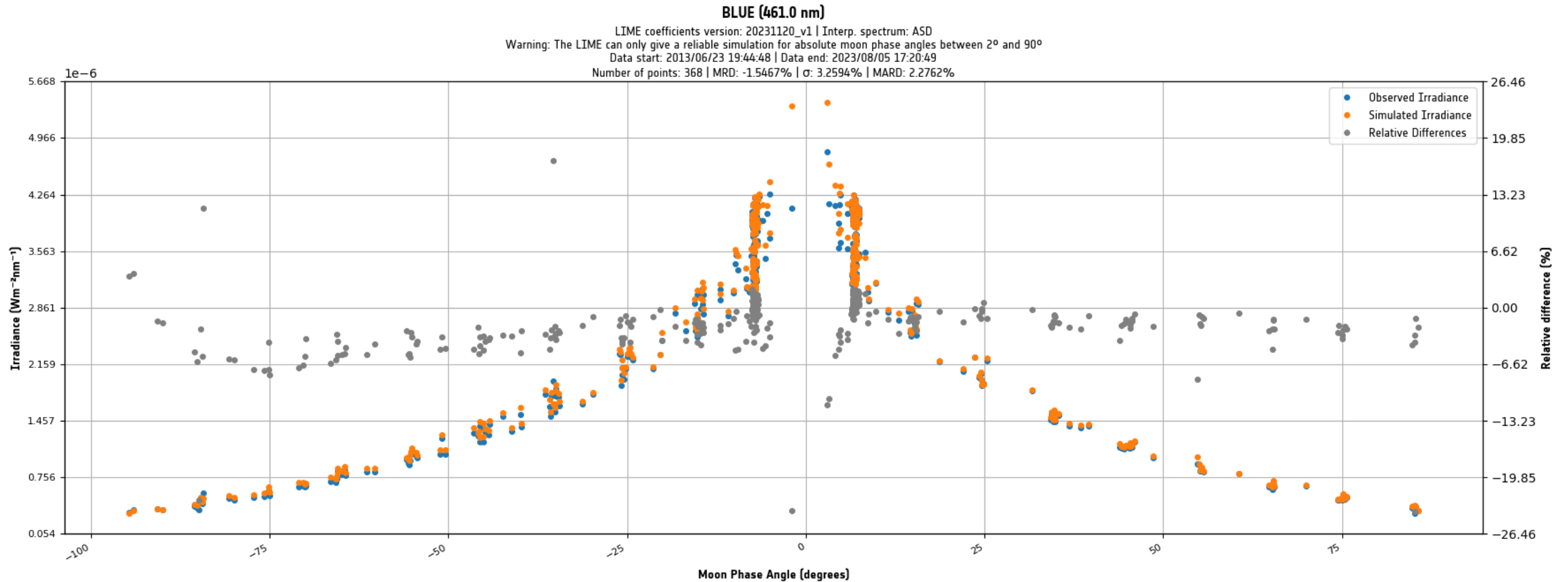
Irradiance



LIME comparison : BLUE



LIME comparison : BLUE

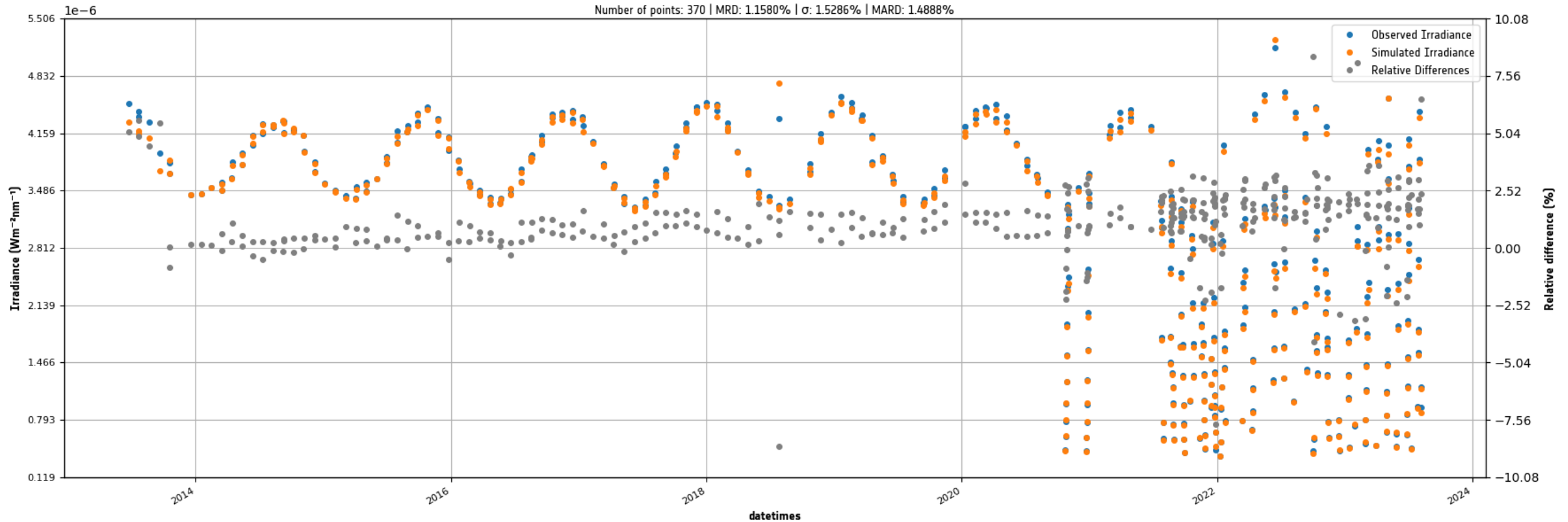


LIME comparison : RED

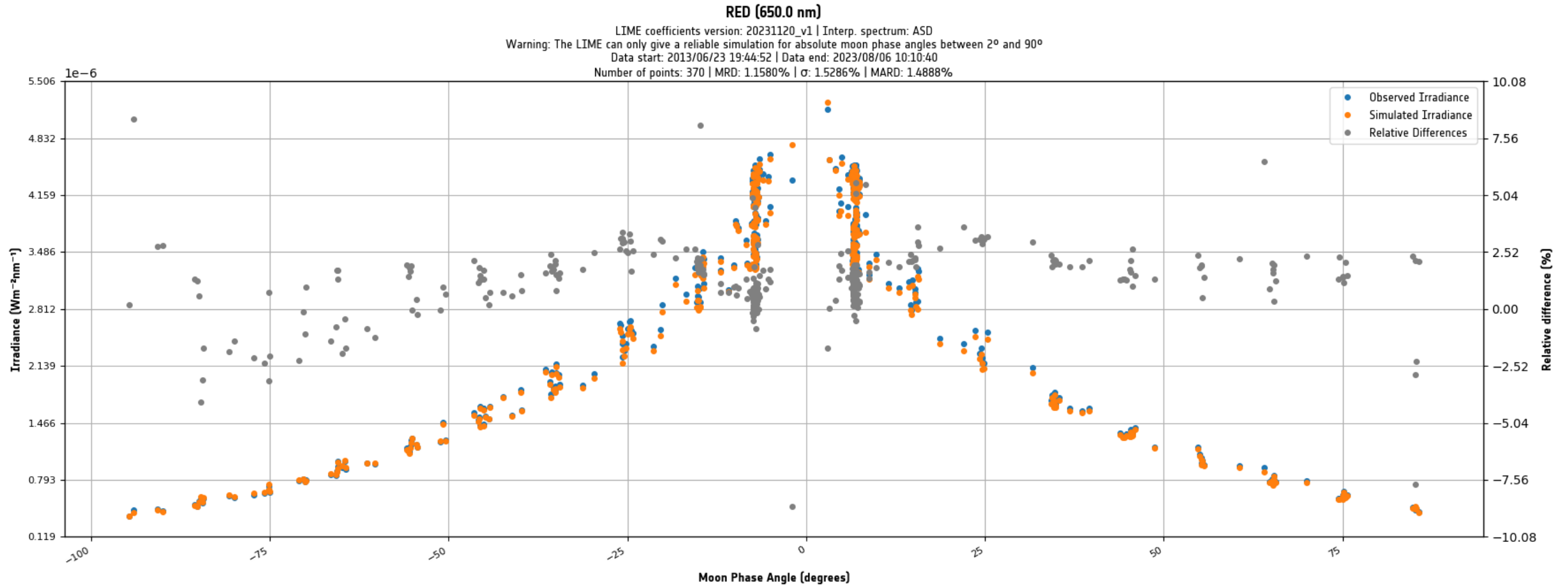


RED (650.0 nm)

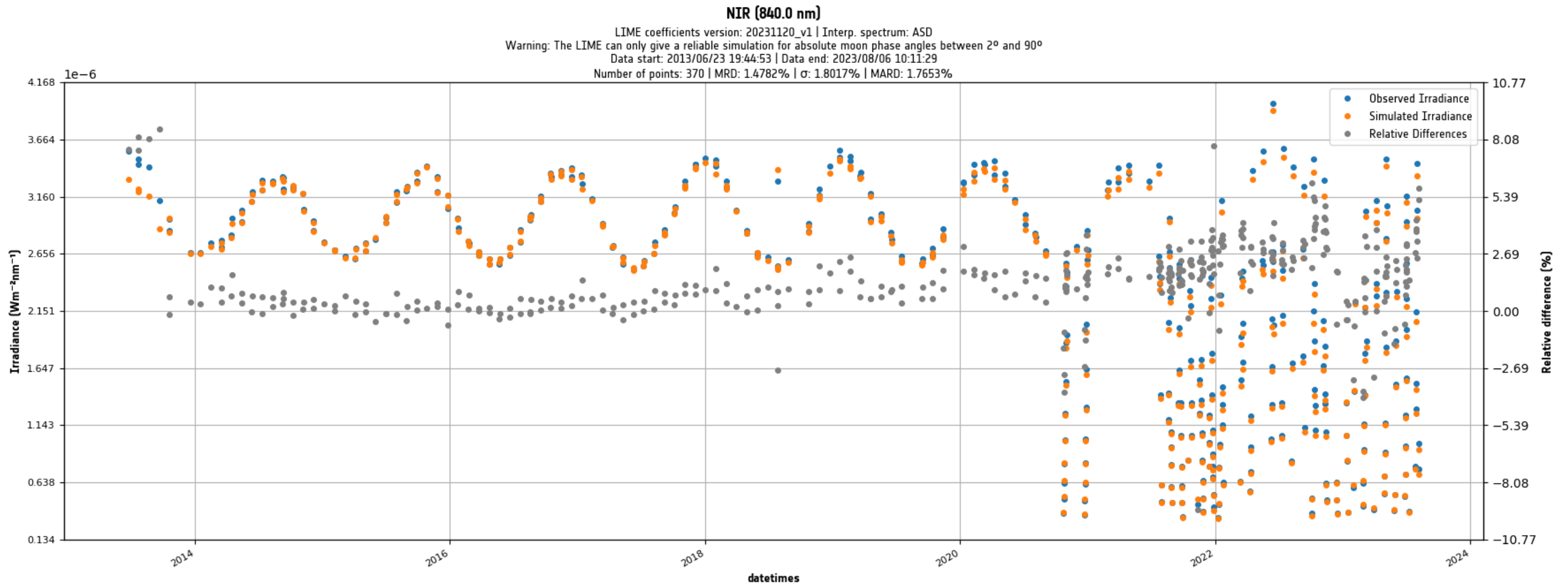
LIME coefficients version: 20231120_v1 | Interp. spectrum: ASD
Warning: The LIME can only give a reliable simulation for absolute moon phase angles between 2° and 90°
Data start: 2013/06/23 19:44:52 | Data end: 2023/08/06 10:10:40
Number of points: 370 | MRD: 1.1580% | σ : 1.5286% | MARD: 1.4888%



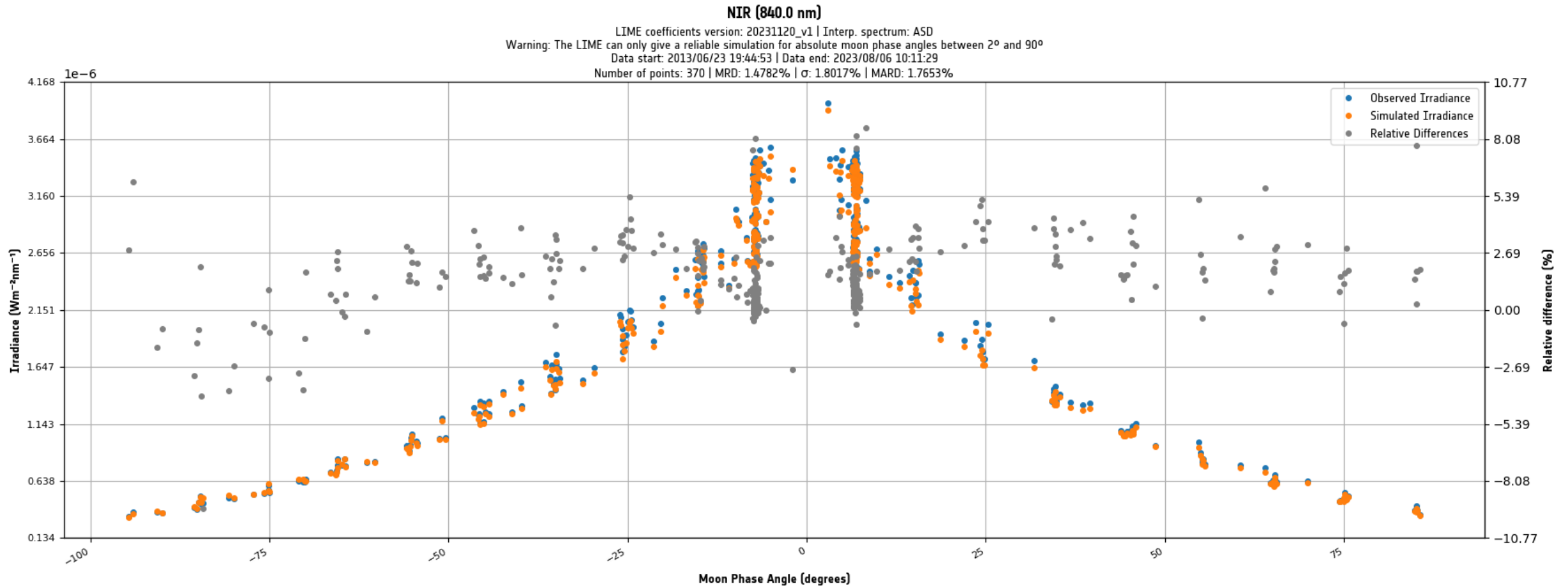
LIME comparison : RED



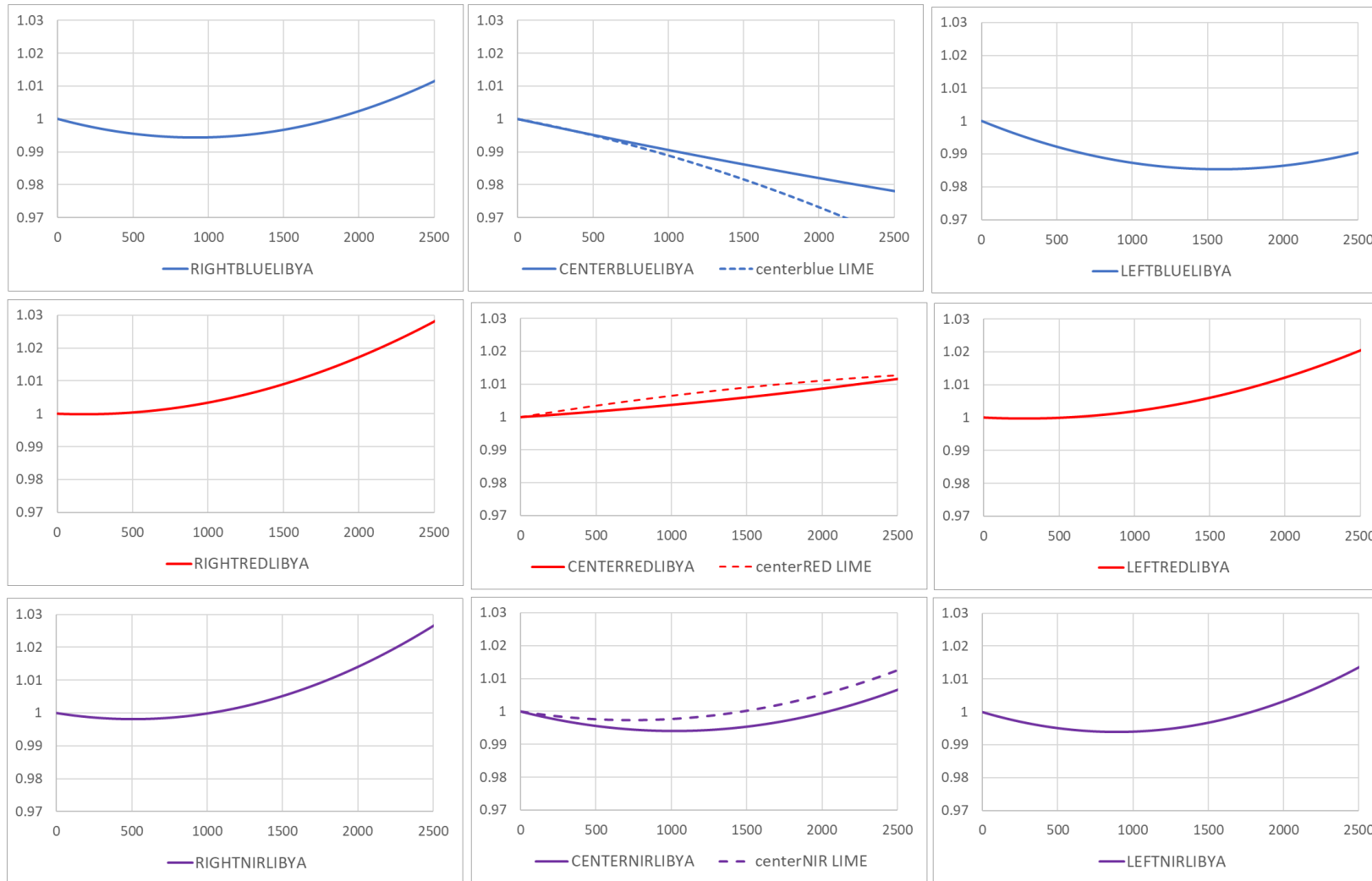
LIME comparison : NIR



LIME comparison : NIR



Degradation models



Continuation : PROBA-V-CC



Belgian Nanosat platform flying
the spare PROBA-V Instrument

Sun-synchronous orbit 500-
550 km altitude range

Global coverage 12 days

Cubesat mass 18kg

launch date and time: 07/10/2023 at 01:36:25 UTC.

Re-use of PROBA-V ground
segment for the IOD data

Conclusion



- PROBA-V is end of life and in decommissioning
- Currently still recording lunar images : as many cycles as possible
- Phase dependency observed
- Revise processing

Thank you!

<http://calvalportal.ceos.org/lime>

