First year of AERONET-OC data from the Río de la Plata turbid waters

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In March 2023, a new AERONET-OC site, the second in South America and fourth in the Southern Hemisphere, has been deployed in the turbid waters of the upper Río de la Plata estuary in Argentina. The RdP-EsNM site is here described and characterized in relation to the spectral features and temporal patterns found using the first year of Level 1.5 SeaPRISM data. A match-up analysis of standard L2 Sentinel-3/OLCI WFR products has been performed.

Site Location

Bands (nm)
400
412.5
490
510
560
620
667
779
865
940
1020

Fig. 1. Location of the SeaPRISM (CE-318T) and HYPSTAR® at the end of a 1,100 m long jetty, 60 km south of Buenos Aires city in the Río de la Plata estuary (RdP-EsNM site)
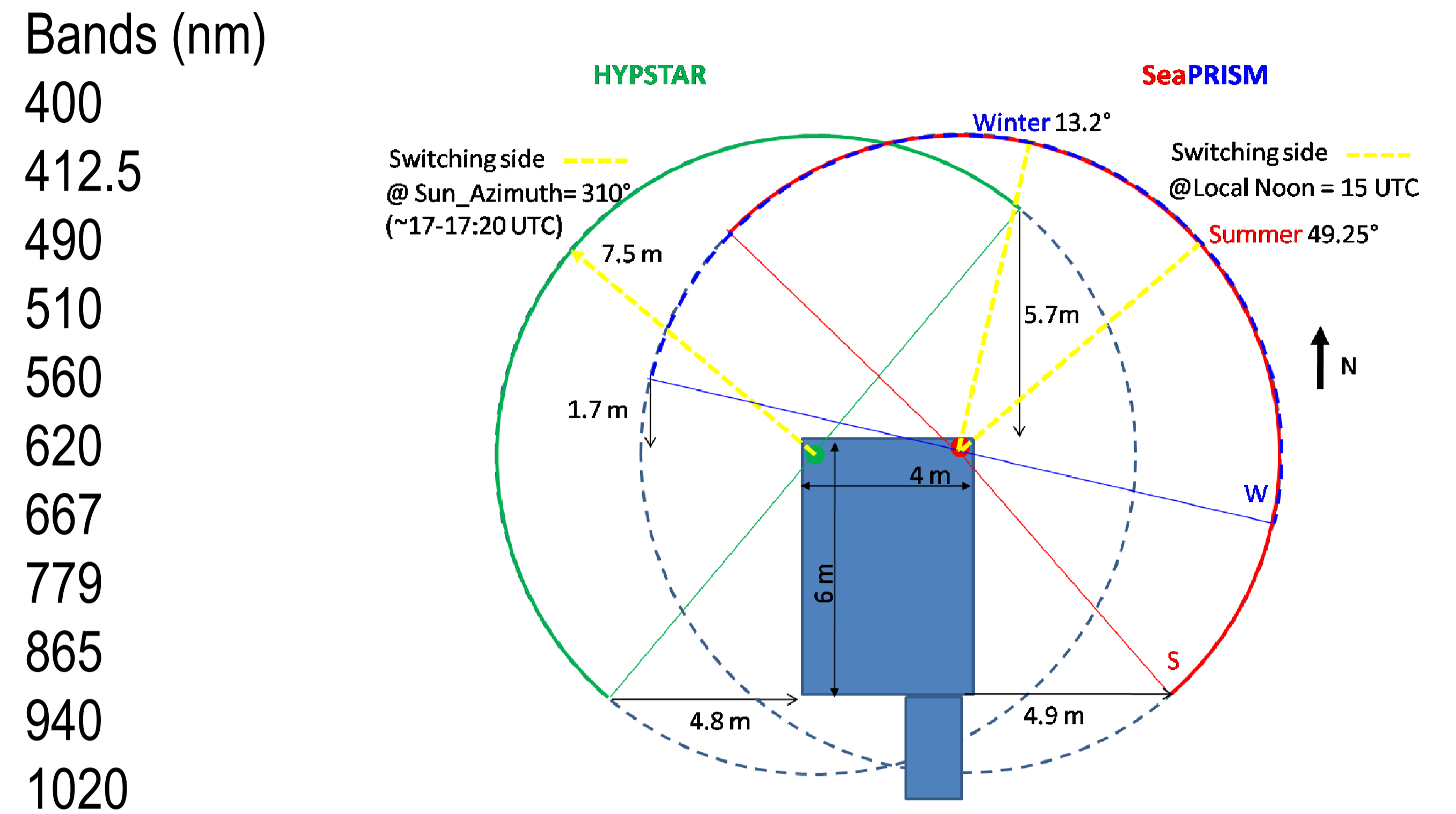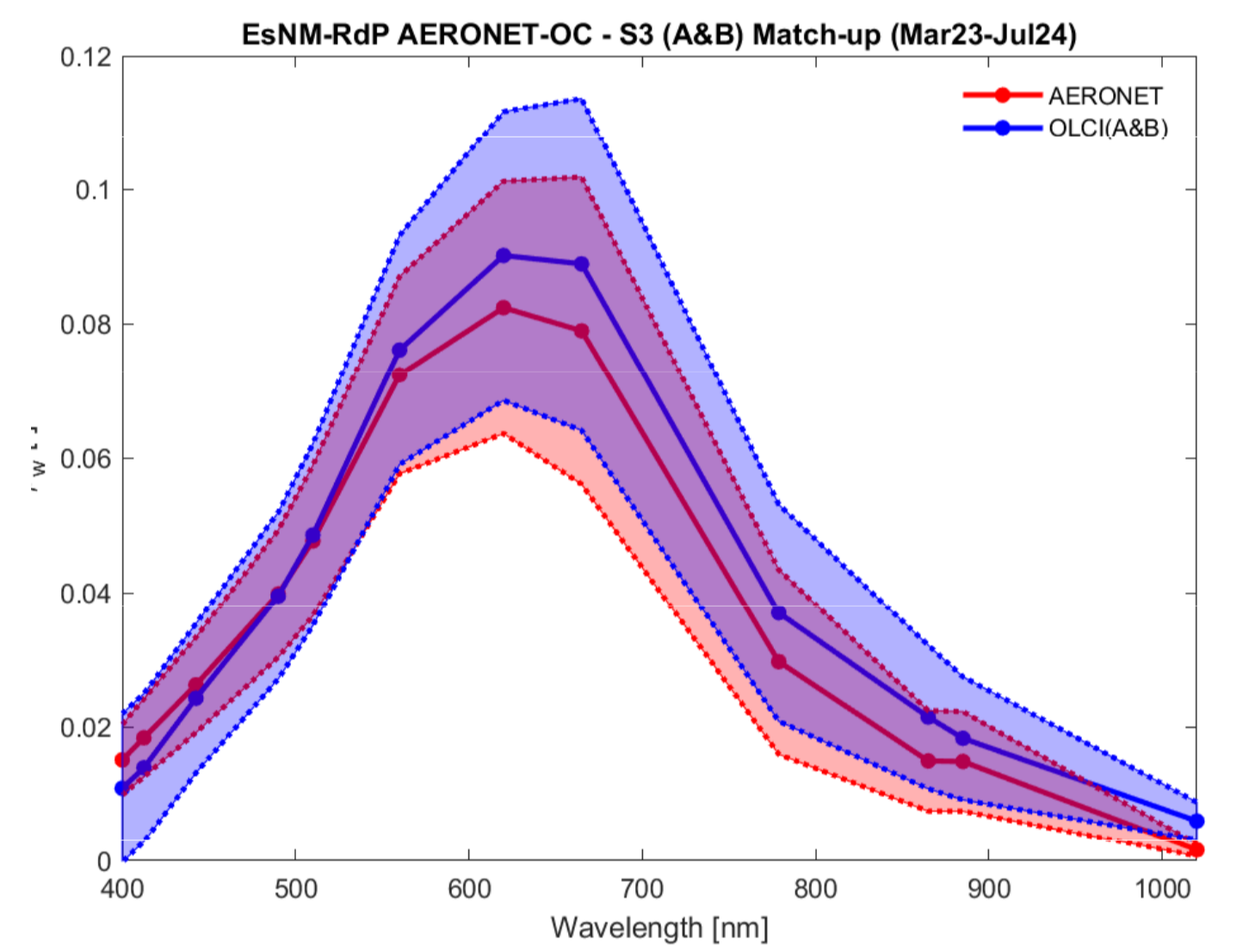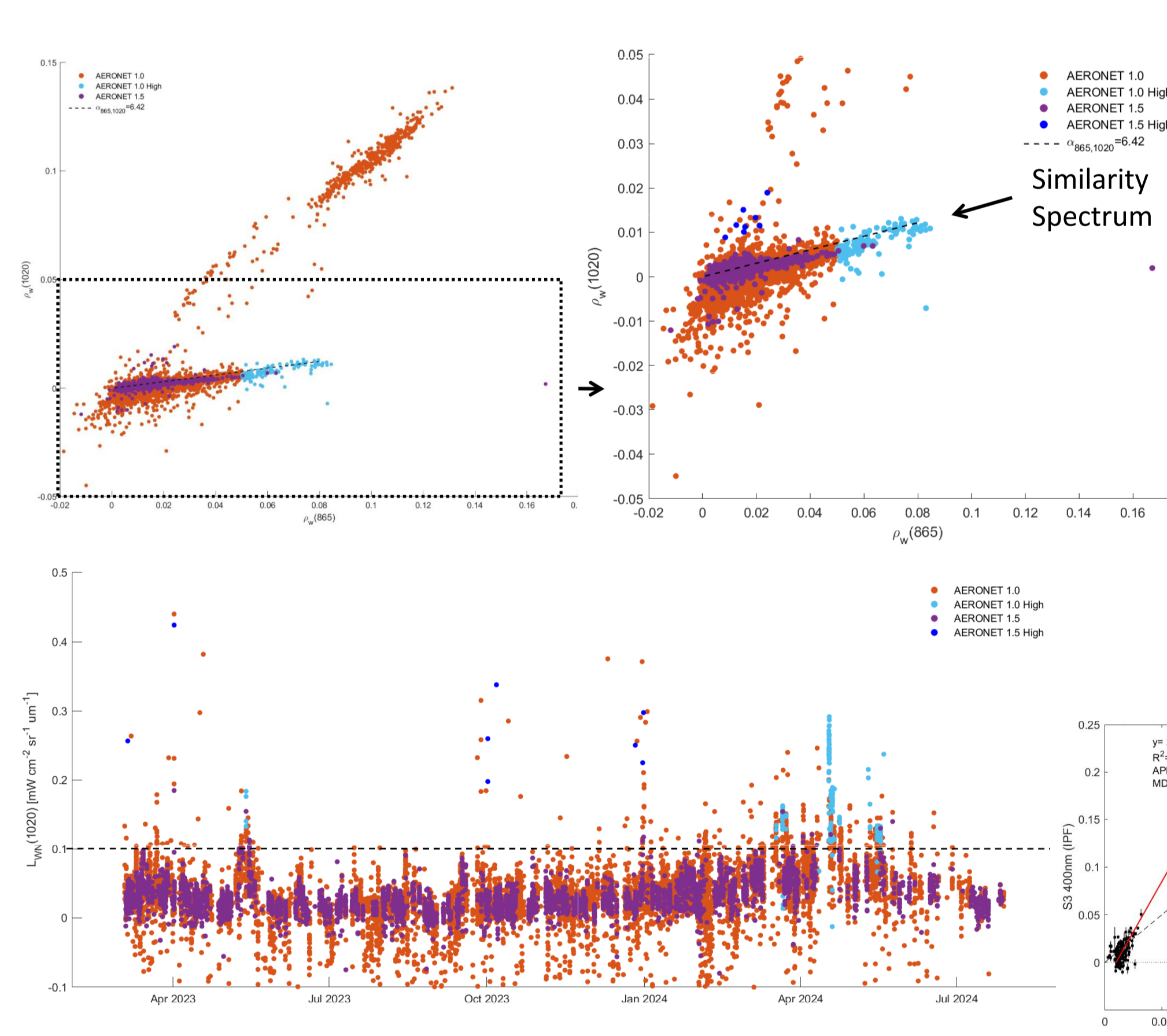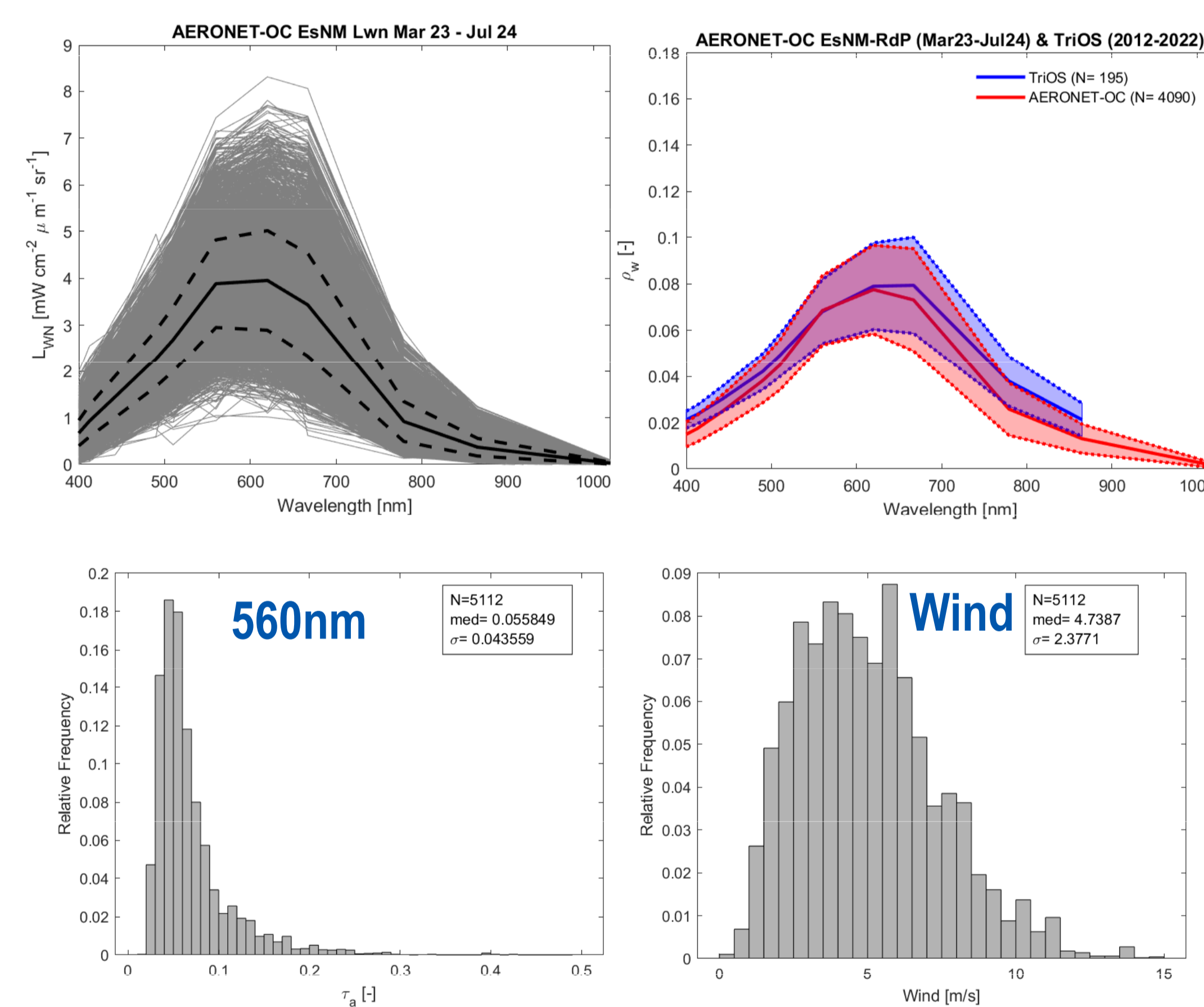
Observing geometry

Fig. 2 Observation geometry of the SeaPRISM (AERONET-OC) and HYPSTAR® (WATERHYPERNETS) sensors
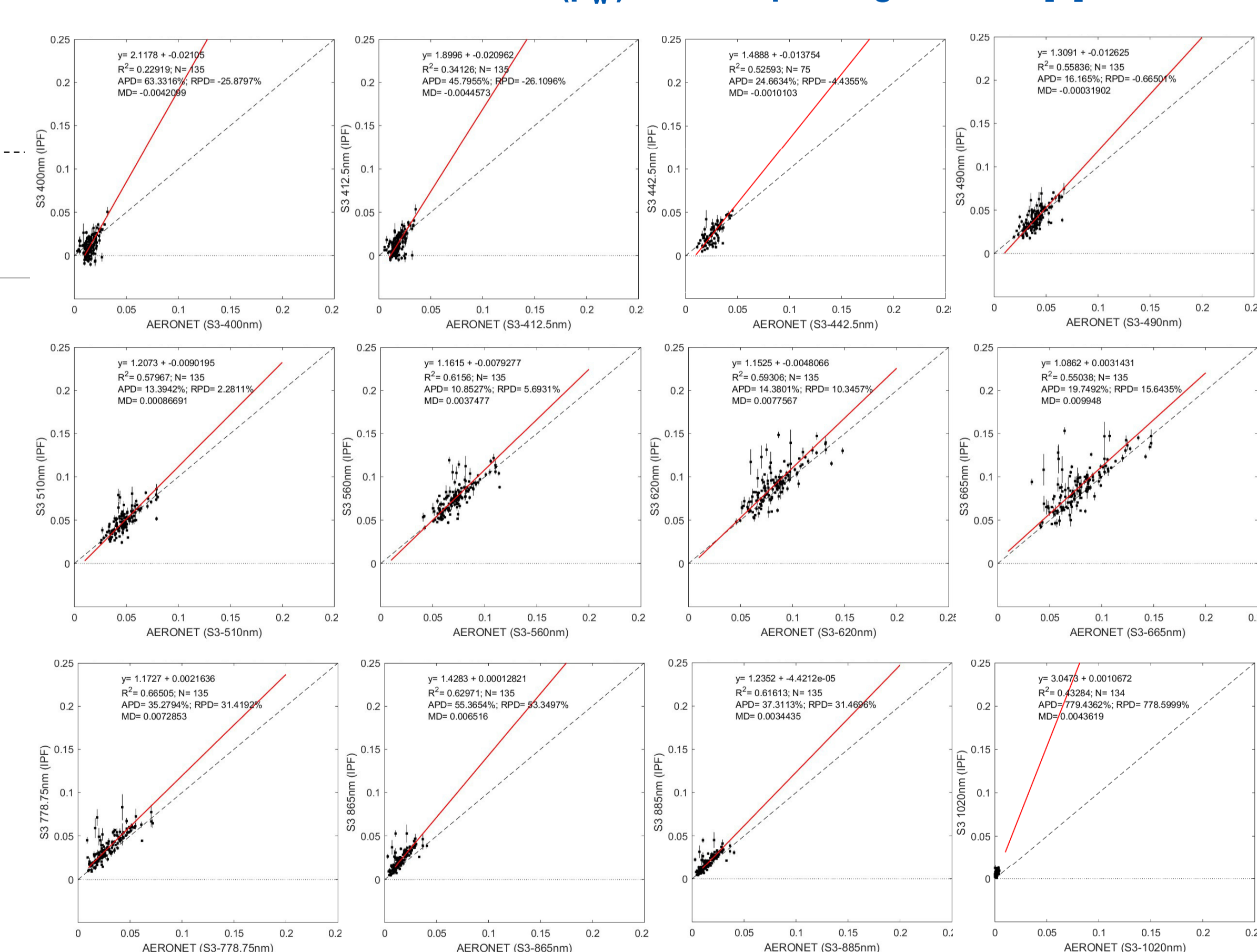
Period Analyzed: 4 March 2023 – 31 July 2024
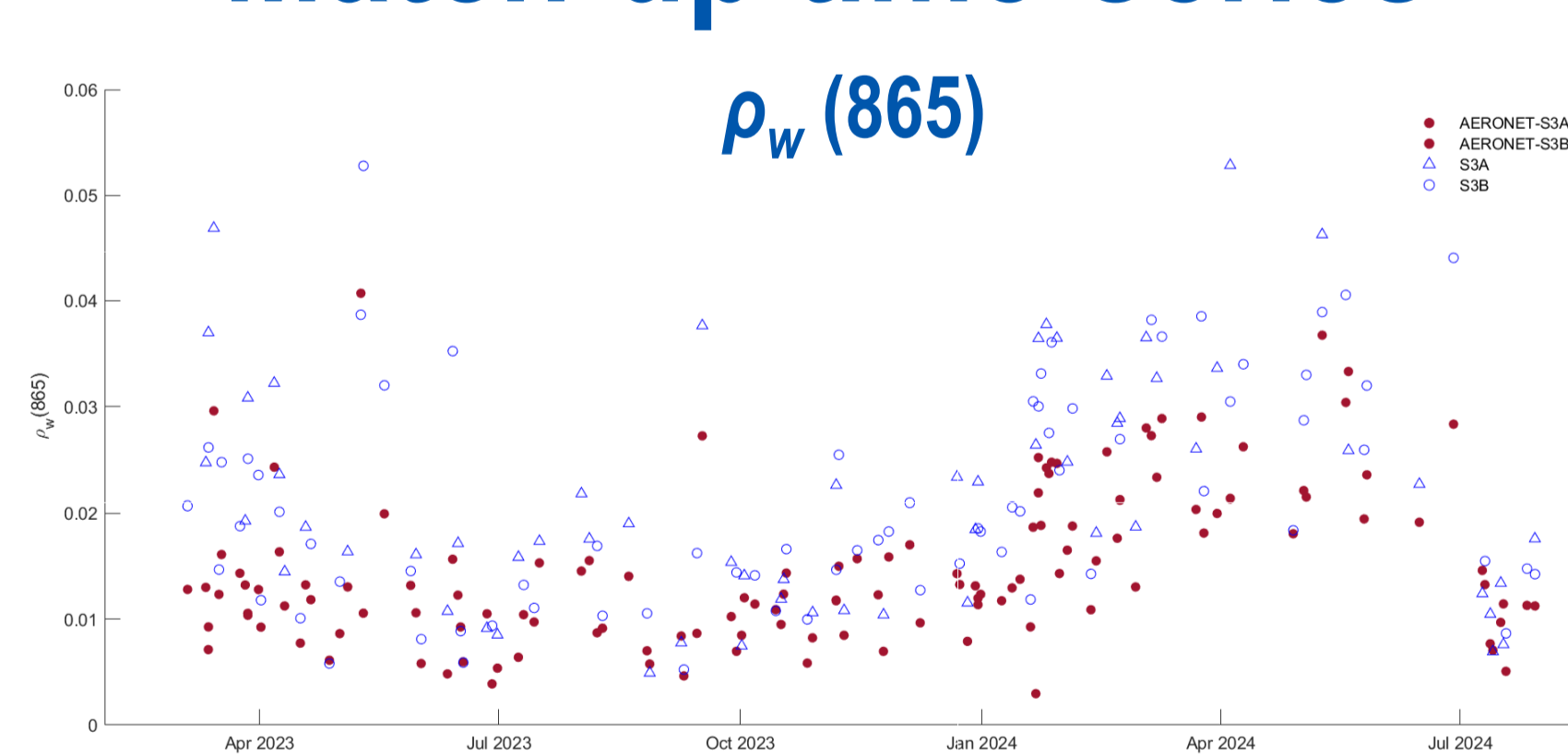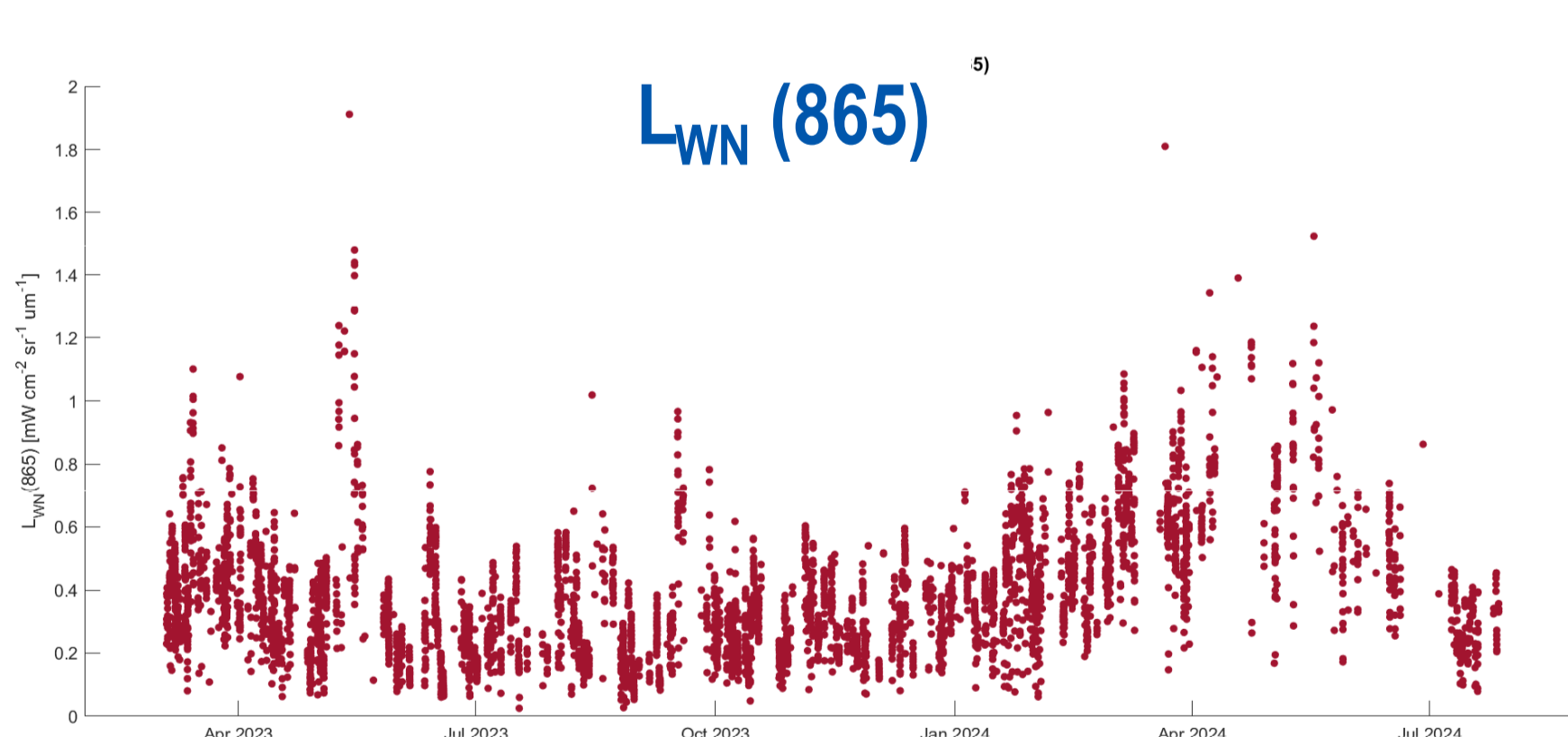
SeaPRISM Level 1.5

SeaPRISM QC

SeaPRISM vs S3

Water-reflectance (ρ_w) match-up using ThoMas [2]

SeaPRISM - Time-series

L_{WN} (865)

Match-up time-series

ρ_w (865)

Conclusions

- First SeaPRISM Level 1.5 data reproduces typical L_{WN} spectral shape of Río de la Plata (previously collected with TriOS/RAMSES radiometer)
- SeaPRISM L_{WN} (865nm) time-series reproduces known Turbidity seasonality [2]
- Comparison with the S3-OLCI data show similar spectral shape and high correlation for bands higher than 490.0 nm
- Initial assessments show a tendency to underestimate/overestimate ρ_w at bands lower/higher than 500nm and a relative increase of the Absolute Percent Difference at 400 and 412.5 nm and 865 nm bands.
- SeaPRISM and S3 ρ_w(865) time-series showed similar seasonality (lower SeaPRISM values)
- Further analysis on the QC applied to the data using Smilarity Spectrum [3] to check outliers is suggested.

References
[1] https://gitlab.eumetsat.int/eumetlab/oceans/ocean-science-studies/ThoMaS
[2] Dogliotti et al. (ECSS 2016)   [3] Ruddick et al. (L&O 2006)

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