Measuring Marine Reflectance at 1020nm with the CIMEL SeaPRISM Instrument

For extremely turbid waters

Experiment summary

- Background:
  - Previously only in situ measurements of SWIR marine reflectance were made with ASD, e.g. [Knaeps et al, 2012]
  - BUT ASD is very expensive and not autonomous
- Objective:
  - Determine whether the CIMEL SeaPRISM instrument can measure marine reflectance at 1020nm … Aeronet_OC
- Experiment:
  - Simultaneous deployment of:
    - 3 radiometer TRIOS system (Ed, Lsea, Lsky)
    - ASD system + Plaque (Lsea, Lsky, Lplaque)
    - Automated CIMEL/SeaPRISM

# Buenos Aires "Fishermans Pier" in Nov2012

SeaPRISM

Trios
(Lsea, Lsky)

Data Processing
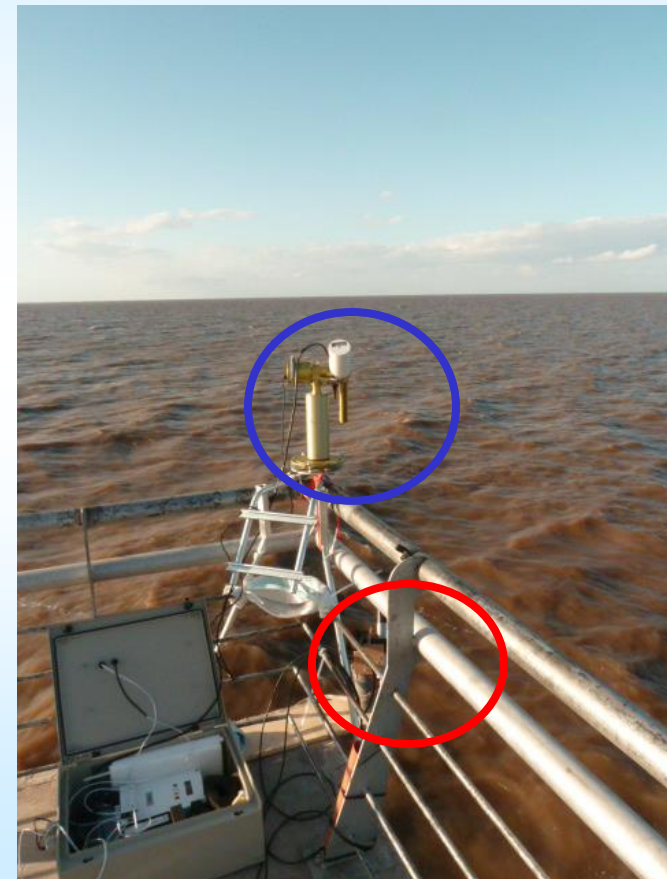
- Both systems:
  - 90° azimuth relative to sun
  - 40° zenith
  - Lw=Lsea-RHOF*Lsky
- Trios as in [Ruddick et al, 2006]
  - 60*(Lsea, Lsky, Ed), QC for time variation, etc.
  - Ave of first 5 good scans
  - RHOF=0.0256 here
- SeaPRISM similar to AERONET-OC [Zibordi et al, 2011]:
  - 11*Lsea, 3*Lsky + 3*Lsun
  - Ave of 2 minimum Lsea (removing sunglint spikes)
  - Ave of all Lsky
  - RHOF=0.0256 here
- For comparison stations:
  - SEAPRISM_Lsea870_STD/AVE <30% (low temporal variation)

Preliminary results for Lw

- Factor 0.122 applied to TRIOS 870nm to account for aw/Ed ratio from 870nm:1020nm
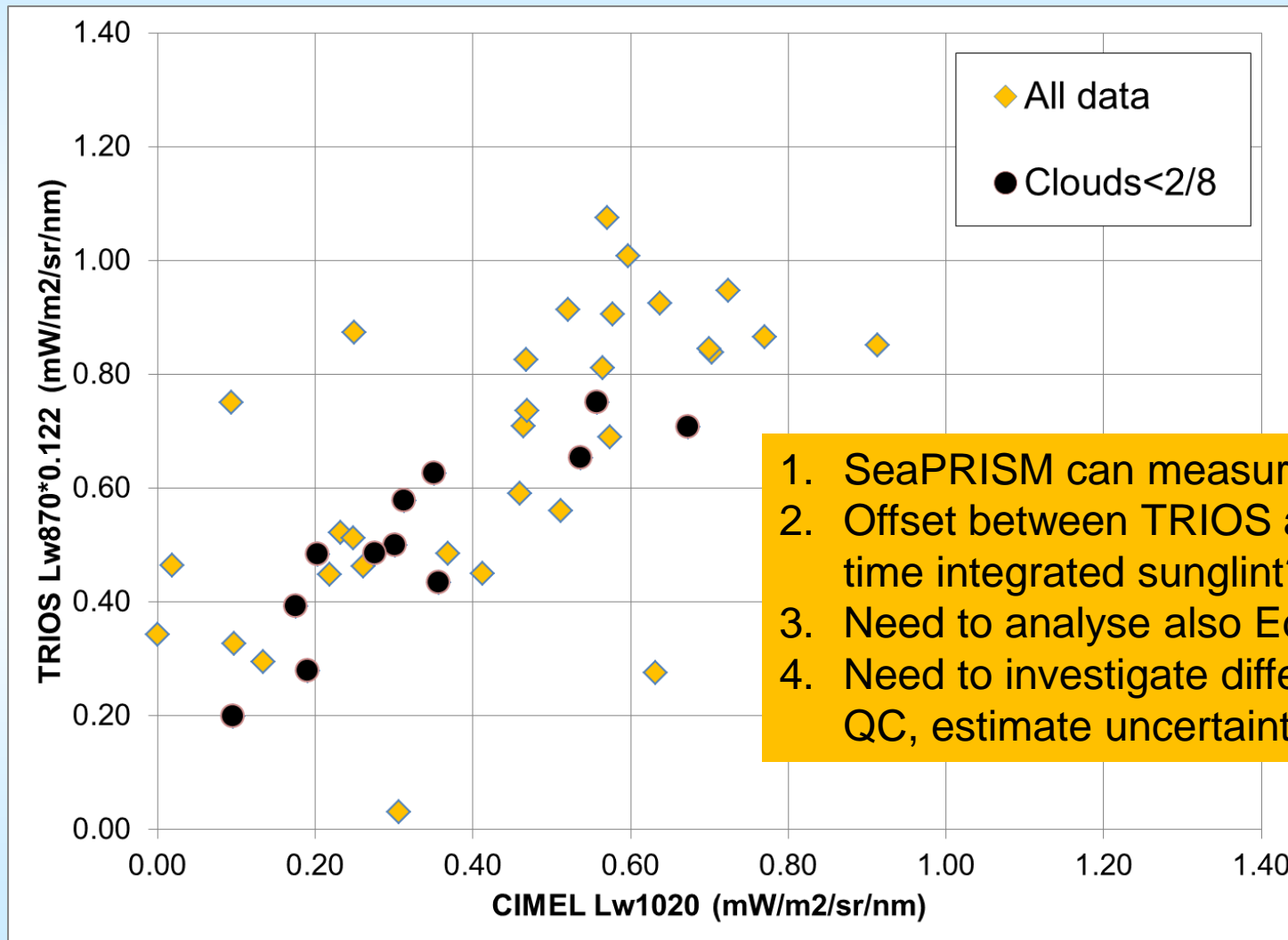
1. SeaPRISM can measure Lw1020nm
2. Offset between TRIOS and SeaPRISM: time integrated sunglint?
3. Need to analyse also Ed and reflectance
4. Need to investigate differences, outlier QC, estimate uncertainties, etc.

Conclusions

- CIMEL/SeaPRISM instrument can measure Lw1020nm
- AERONET-OC network could measure Rrs1020nm in extremely turbid waters
- … and hence validate OLCI 1020nm band
- Next steps (SeaSWIR experiment):
  - Improvements of data processing and QC
  - Extension of comparison to Ed and Reflectance
  - Comparison with ASD 1020nm reflectance
- Next steps (post-SeaSWIR):
  - Testing with AERONET-OC installation in extremely turbid waters