File: SAMPLE_HYPERSAS_NOTRACKER Collected: Wed Aug 22 21:45:32 2018

L1A : Process RAW to L1A

Raw binary to HDF5 and filter data on SZA.

Processing Parameters and metadata:
HyperInSPACE version: 1.2.0
SZA Filter (L1A): 70.0

Example of HyperSAS with NO sun tracker robot
/version=R0
/investigators=Philip_Marlow
/affiliations=Chandler_U
/contact=trickydick@cu.edu
/experiment=sample_NoSolarTracker
/cruise=sample_cruise
/documents=README.md
/instrument_manufacturer=Satlantic
/instrument_model=HyperSAS
/calibration_date=20180730
/calibration_files=SATTHS0045A.tdf,HSL0386D.cal,GPRMC_NMEA0183v3.01.tdf,HSE0488Ea.cal,HSL0385D.cal,SATMSG.tdf,SATPYR.tdf,HLD0385D.cal,IRP3397A.cal,HLD0386D.cal,SAS045_20180730.sip,GPGGA_NMEA0183.tdf,SATNAV0001A.tdf,HED0488Ea.cal
/data_type=above_water
/data_status=preliminary
/measurement_depth=0
/platform=sample_ship

Process log:
Process Single Level
ProcessL1a.processL1a: 21-Apr-2023 19:30:16
L1A file produced:

/ssdwork/GitRepos/HyperInSPACE/Data/Sample_Data/L1A/SAMPLE_HYPERSAS_NOTRACKER_L1A.hdf
Process Single Level: /ssdwork/GitRepos/HyperInSPACE/Data/Sample_Data/L1A/SAMPLE_HYPERSAS_NOTRACKER_L1A.hdf - SUCCESSFUL

File: SAMPLE_HYPERSAS_NOTRACKER Collected: Wed Aug 22 21:45:32 2018

L1AQC : Process L1A to L1AQC

Low level QC (pitch, roll, yaw, and azimuth) and deglitching.

Processing Parameters:
Rotator Home Angle: 0.0
Rotator Delay: 60.0
Rel Azimuth Min: 90.0
Rel Azimuth Max: 135.0
ES Dark Window: 11
ES Light Window: 5
ES Dark Sigma: 3.2
ES Light Sigma: 3.5
LT Dark Window: 11
LT Light Window: 5
LT Dark Sigma: 3.0
LT Light Sigma: 3.2
LI Dark Window: 11
LI Light Window: 5
LI Dark Sigma: 3.2
LI Light Sigma: 3.4
ES Light Thresh. Band: None
ES Light Min.: None
ES Light Max.: None
ES Dark Thresh. Band: None
ES Dark Min.: None
ES LDark Max.: None
LI Light Thresh. Band: 505.55
LI Light Min.: None
LI Light Max.: None
LI Dark Thresh. Band: 505.55
LI Dark Min.: None
LI LDark Max.: None
LT Light Thresh. Band: None
LT Light Min.: None
LT Light Max.: None
LT Dark Thresh. Band: None
LT Dark Min.: None
LT Dark Max.: None

Process log:
Process Single Level
Found data: station
Found data: lat
Found data: lon
Found data: speed_f_w
Found data: heading
Found data: wt
Found data: sal

Found data: wind
Found data: cloud
Found data: waveht
Found data: relaz
Deglitching file Config/sample_NOTRACKER_anoms.csv found for sample_NOTRACKER. Using these parameters.
ProcessL1aqc.processL1aqc: 21-Apr-2023 19:38:22
Filtering file for bad Relative Solar Azimuth
  Flag data from: 2018-08-22 22:36:03+00:00 to 2018-08-22 22:36:17+00:00
  Flag data from: 2018-08-22 22:37:17+00:00 to 2018-08-22 22:37:17+00:00
  Flag data from: 2018-08-22 22:38:03+00:00 to 2018-08-22 22:38:48+00:00
Percentage of data out of Relative Solar Azimuth bounds: 23 %
  Flag data from TT2: 2018-08-22 22:39:32+00:00 to 2018-08-22 22:53:32+00:00 (HHMMSSMSS)
Eliminate combined filtered data from datasets.**********
Remove GPGGA_NMEA0183.tdf Data
  Length of dataset prior to removal 10225 long
  Length of records removed from dataset: 2248
  Data end 7977 long, a loss of 22 %
Remove ES_DARK Data
  Length of dataset prior to removal 1229 long
  Length of records removed from dataset: 270
  Data end 959 long, a loss of 22 %
Remove LI_DARK Data
  Length of dataset prior to removal 1206 long
  Length of records removed from dataset: 264
  Data end 942 long, a loss of 22 %
Remove LT_DARK Data
  Length of dataset prior to removal 300 long
  Length of records removed from dataset: 65
  Data end 235 long, a loss of 22 %
Remove ES_LIGHT Data
  Length of dataset prior to removal 5109 long
  Length of records removed from dataset: 1106
  Data end 4003 long, a loss of 22 %
Remove LI_LIGHT Data
  Length of dataset prior to removal 5117 long
  Length of records removed from dataset: 1121
  Data end 3996 long, a loss of 22 %
Remove LT_LIGHT Data
  Length of dataset prior to removal 1501 long
  Length of records removed from dataset: 330
  Data end 1171 long, a loss of 22 %
ProcessL1aqc.processL1aqc: 21-Apr-2023 19:38:26
Screening GPGGA_NMEA0183.tdf for clean timestamps.
Screening ES_DARK for clean timestamps.
Screening LI_DARK for clean timestamps.
Screening LT_DARK for clean timestamps.
Screening ES_LIGHT for clean timestamps.
Screening LI_LIGHT for clean timestamps.

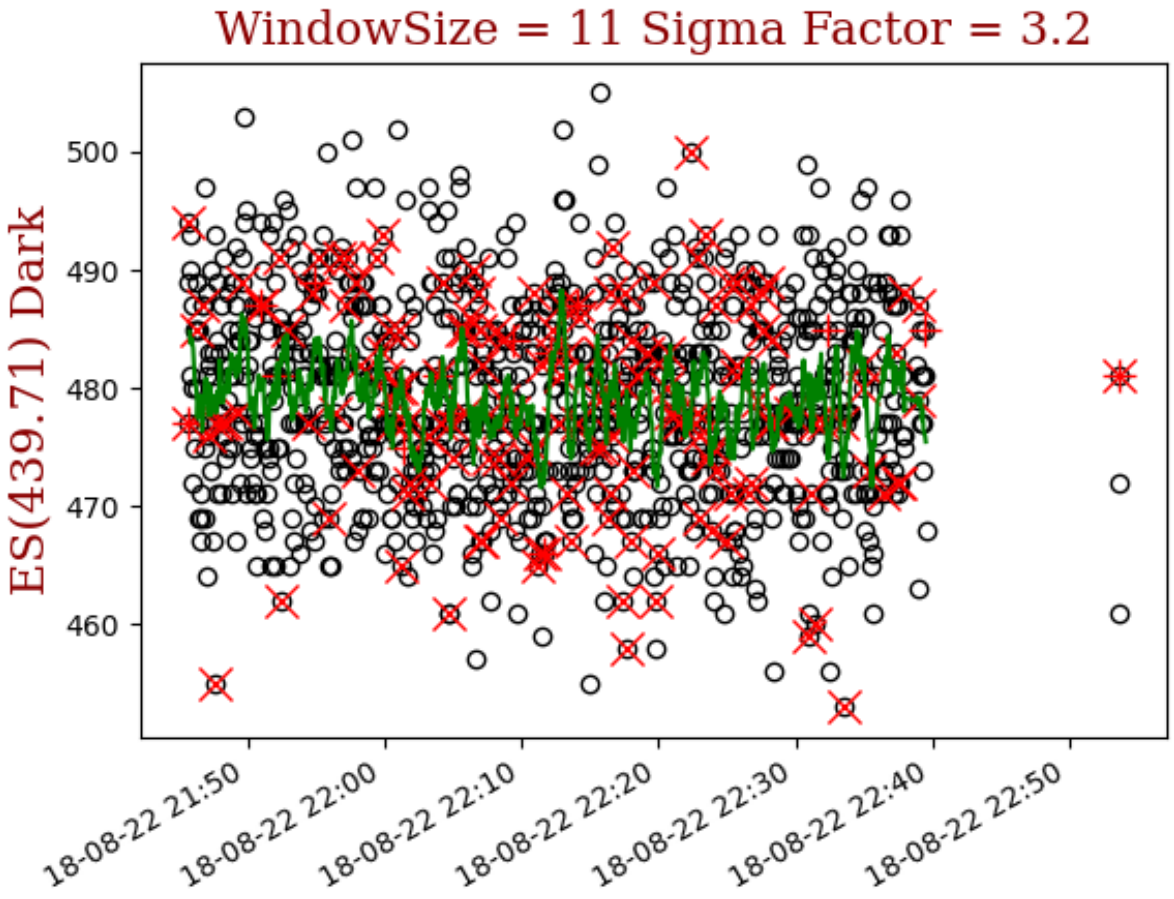
Screening LT_LIGHT for clean timestamps.
Screening ANCILLARY_METADATA for clean timestamps.
ES
Deglitching dark
Data reduced by 168 (18%)
Deglitching light
Data reduced by 738 (18%)
LI
Deglitching dark
Data reduced by 182 (19%)
Deglitching light
Data reduced by 662 (17%)
LT
Deglitching dark
Data reduced by 59 (25%)
Deglitching light
Data reduced by 43 (4%)
L1AQC file produced:

/ssdwork/GitRepos/HyperInSPACE/Data/Sample_Data/L1AQC/SAMPLE_HYPERSAS_NOTRACKER_L1AQC.hdf
Process Single Level: /ssdwork/GitRepos/HyperInSPACE/Data/Sample_Data/L1AQC/SAMPLE_HYPERSAS_NOTRACKER_L1AQC.hdf - SUCCESSFUL
id: SATTHS0045
id: SATHSL0386
id: $GPRMC
id: SATHSE0488
id: SATHSL0385
id: SATMSG
id: SATPYR
id: SATHLD0385
id: SATIRP3397
id: SATHLD0386
id: $GPGGA
id: SATNAV0001
id: SATHED0488

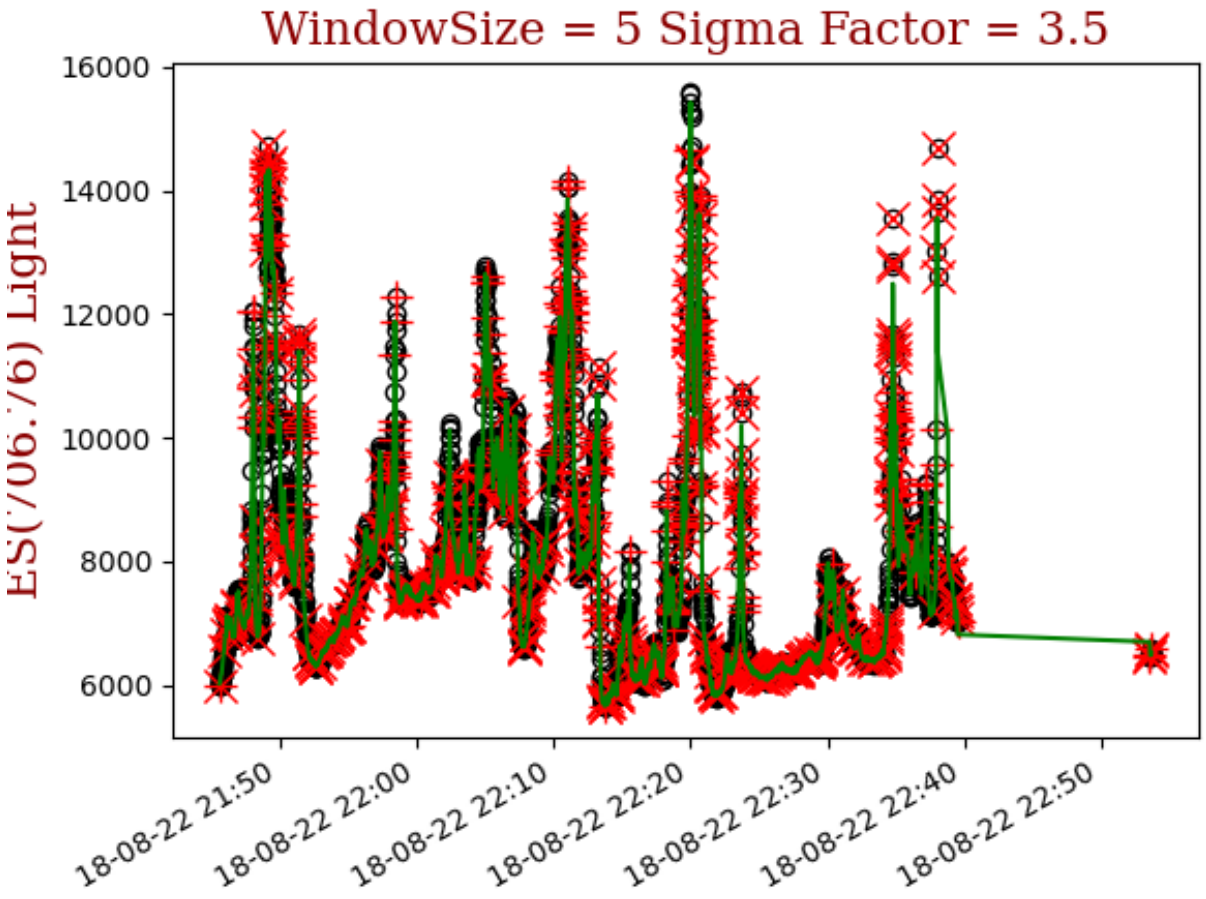
Example Deglitching

Randomized. Complete plots of hyperspectral deglitching from anomaly analysis can be found in [output_directory]/Plots/L1AQC_Anoms.

Marked for exclusions in ALL bands

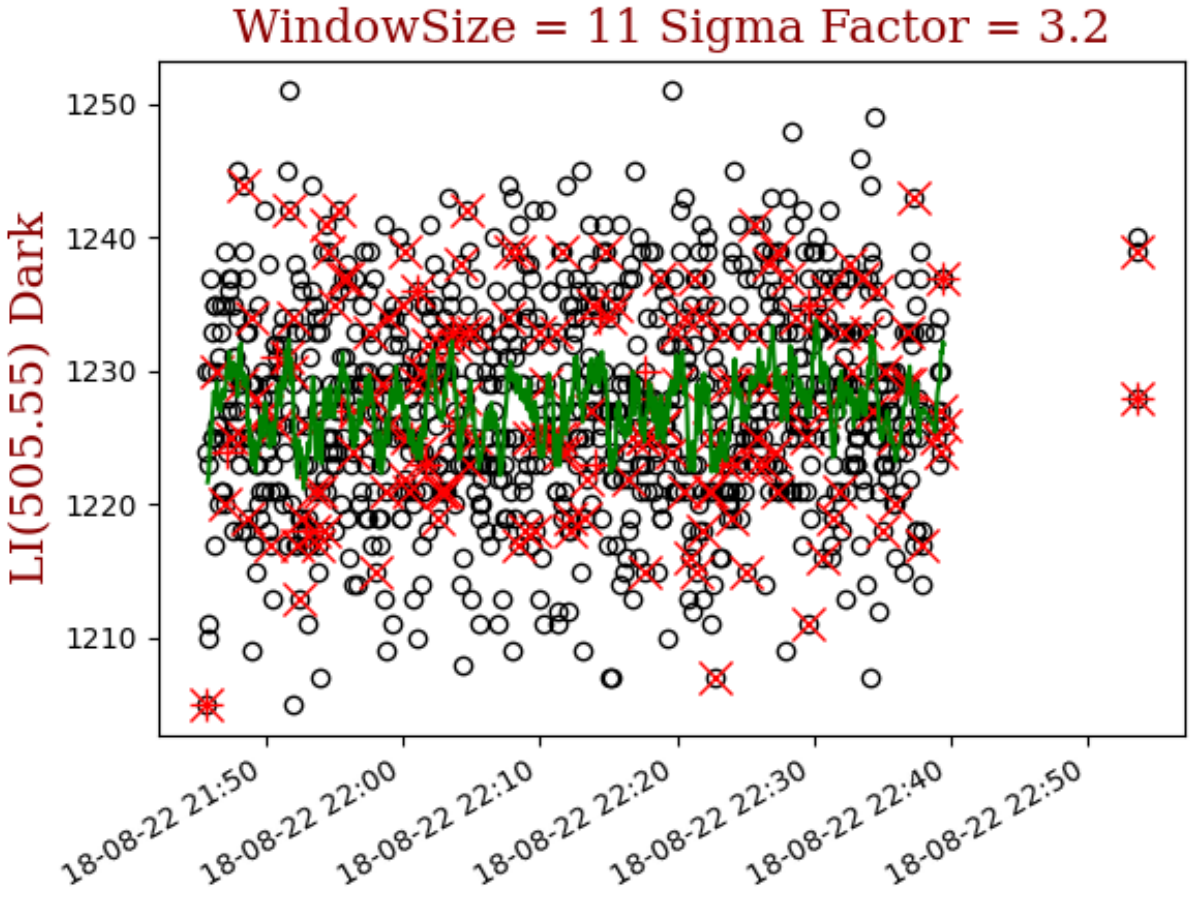


Marked for exclusions in ALL bands



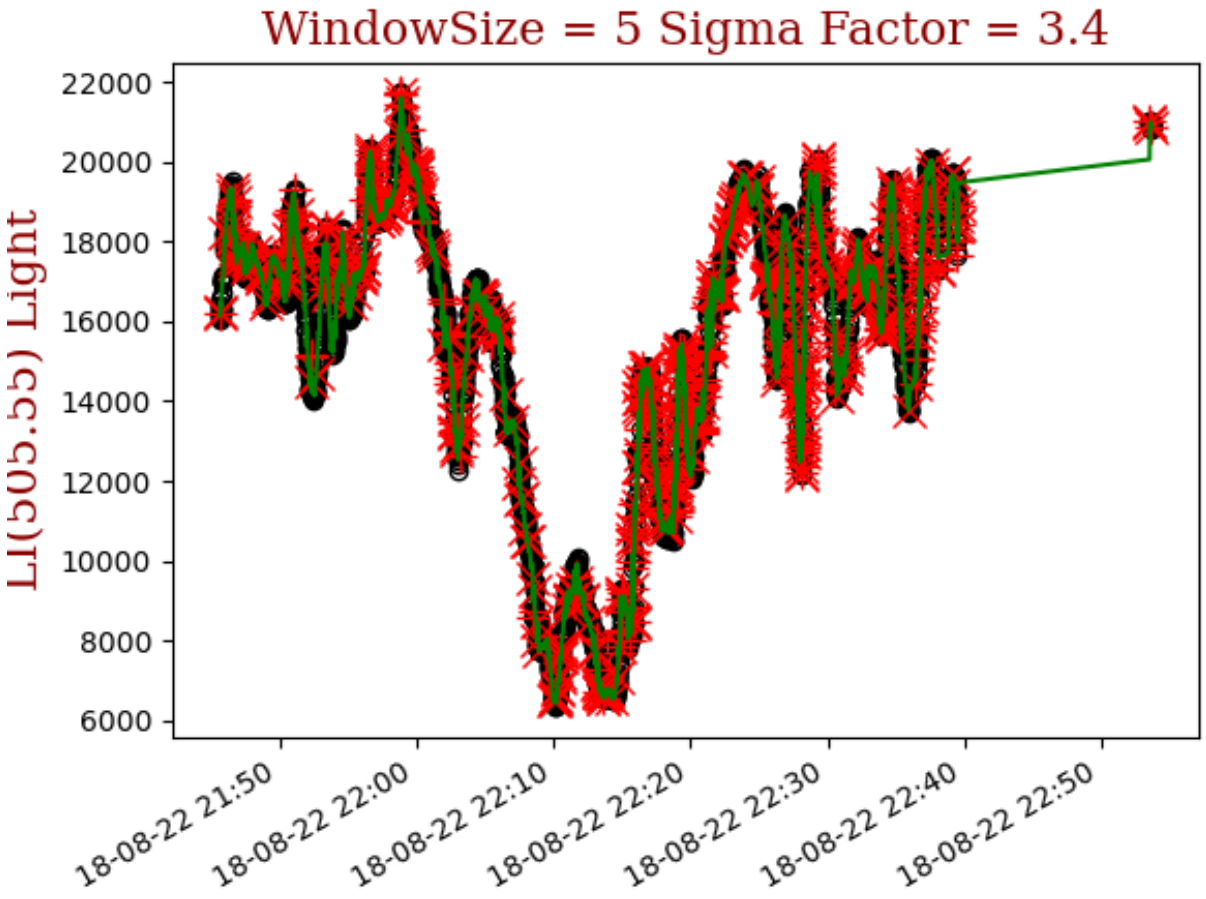
File: SAMPLE_HYPERSAS_NOTRACKER Collected: Wed Aug 22 21:45:32 2018

Marked for exclusions in ALL bands



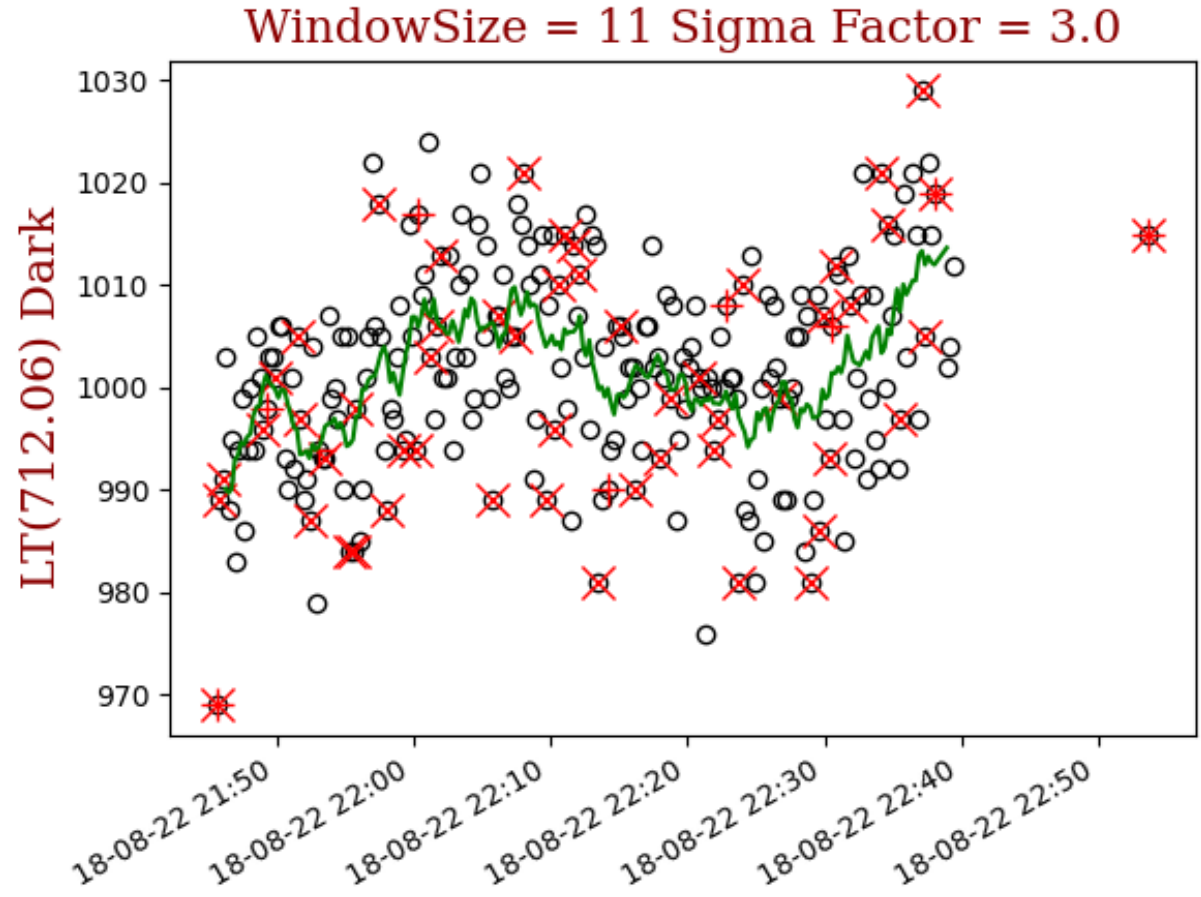
File: SAMPLE_HYPERSAS_NOTRACKER Collected: Wed Aug 22 21:45:32 2018

Marked for exclusions in ALL bands



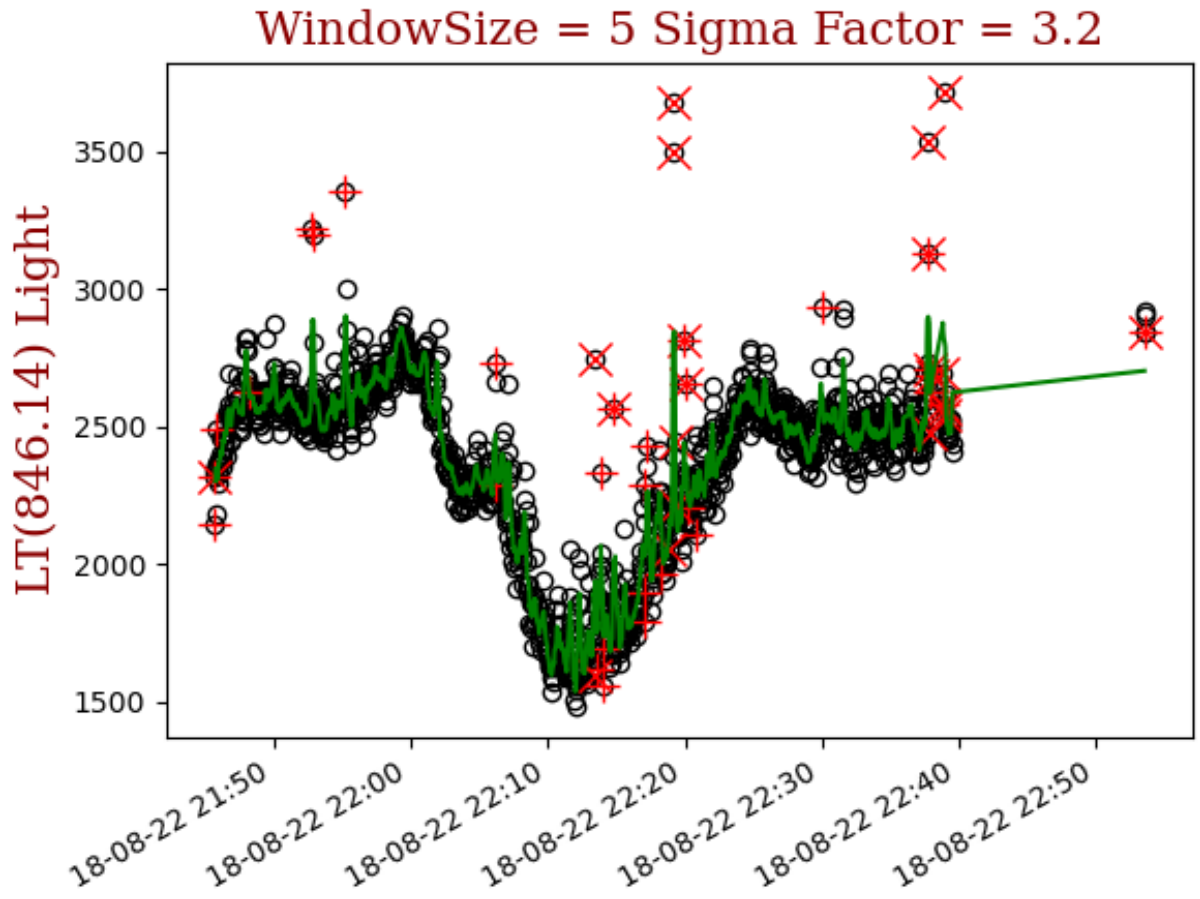
File: SAMPLE_HYPERSAS_NOTRACKER Collected: Wed Aug 22 21:45:32 2018

Marked for exclusions in ALL bands



File: SAMPLE_HYPERSAS_NOTRACKER Collected: Wed Aug 22 21:45:32 2018

Marked for exclusions in ALL bands



File: SAMPLE_HYPERSAS_NOTRACKER Collected: Wed Aug 22 21:45:32 2018

L1B : Process L1AQC to L1B

Dark correction. Calibration and/or full characterization. Match timestamps & wavebands.

Processing Parameters: None
Cal. Type: Default/Factory
Wavelength Interp Int: 3.3 nm

Process log:
Process Single Level
ProcessL1b:
/ssdwork/GitRepos/HyperInSPACE/Data/Sample_Data/L1AQC/SAMPLE_HYPERSAS_NOTRACKER_L1AQC.hdf
ProcessL1b.processL1b: 21-Apr-2023 19:41:46
Dark Correction: ES
Dark Correction: LI
Dark Correction: LT
ProcessL1b_DefaultCal.processL1b: 21-Apr-2023 19:43:09
Applying factory calibrations.
  Group: ANCILLARY_METADATA
  Group: ES
    File: SATHSE0488
  Group: GPGGA_NMEA0183.tdf
    File: $GPGGA
  Group: LI
    File: SATHSL0385
  Group: LT
    File: SATHSL0386
ProcessL1b_Interp.processL1b_Interp: 21-Apr-2023 19:43:14
LT has fewest records (as expected) - interpolating to LT; 1128 records
Interpolate Data ES
Interpolate Data LI
Interpolate Data LT
Skip. Other instruments are being interpolated to this one.
Interpolate Data LATITUDE
Interpolate Data LONGITUDE
Interpolate Data REL_AZ
found NaN 146
Interpolate Data SZA
Interpolate Data SOLAR_AZ
Interpolate Data STATION
found NaN 146
found NaN 158
Interpolate Data HEADING
Interpolate Data LATITUDE
Interpolate Data LONGITUDE
Interpolate Data SALINITY
Interpolate Data SST
Interpolate Data WINDSPEED

Interpolate Data CLOUD
found NaN 146
found NaN 158
Interpolate Data WAVE_HT
found NaN 146
found NaN 158
Interpolate Data SPEED_F_W
L1B file produced:

/ssdwork/GitRepos/HyperInSPACE/Data/Sample_Data/L1B/SAMPLE_HYPERSAS_NOTRACKER_L1B.hdf
Process Single Level: /ssdwork/GitRepos/HyperInSPACE/Data/Sample_Data/L1B/SAMPLE_HYPERSAS_NOTRACKER_L1B.hdf - SUCCESSFUL
id: SATTHS0045
id: SATHSL0386
id: $GPRMC
id: SATHSE0488
id: SATHSL0385
id: SATMSG
id: SATPYR
id: SATHLD0385
id: SATIRP3397
id: SATHLD0386
id: $GPGGA
id: SATNAV0001
id: SATHED0488

Example Temporal Interpolations

Randomized. Complete plots of hyperspectral interpolations can be found in [output_directory]/Plots/L1B_Interp.
None found.

File: SAMPLE_HYPERSAS_NOTRACKER Collected: Wed Aug 22 21:45:32 2018

L1BQC : Process L1B to L1BQC

Apply more quality control filters.

Processing Parameters:
Max Wind: 10.0
Min SZA: 20.0
Max SZA: 60.0
Filter Sigma Es: 5.0
Filter Sigma Li: 8.0
Filter Sigma Lt: 3.0
Cloud Filter: 1.0
Es Filter: 2.0
Dawn/Dusk Filter: 1.0
Rain/Humidity Filter: 1.095

Process log:
Process Single Level
Model data for Wind and AOD may be used to replace blank values. Reading in model data...
Ancillary file found locally: GMAO_MERRA2.20180822T210000.MET.nc
Ancillary file found locally: GMAO_MERRA2.20180822T210000.AER.nc
Ancillary file found locally: GMAO_MERRA2.20180822T220000.MET.nc
Ancillary file found locally: GMAO_MERRA2.20180822T220000.AER.nc
Filling in field data with model data where needed.
Filling in ancillary data with default values where still needed.
Applying Lt(NIR)>Lt(UV) quality filtering to eliminate spectra.
0.0% of spectra flagged
Percentage of data out of Wind limits: 0 %
Percentage of data out of SZA limits: 0 %
Applying spectral filtering to eliminate noisy spectra.
0.4% of Es data flagged
0.0% of Li data flagged
7.9% of Lt data flagged
Remove IRRADIANCE Data
  Length of dataset prior to removal 1128 long
  Length of dataset after removal 1037 long: 8% removed
Remove RADIANCE Data
  Length of dataset prior to removal 1128 long
  Length of dataset after removal 1037 long: 8% removed
Remove ANCILLARY Data
  Length of dataset prior to removal 1128 long
  Length of dataset after removal 1037 long: 8% removed
Applying meteorological filtering to eliminate spectra.
0.2% of spectra flagged
Remove IRRADIANCE Data
  Length of dataset prior to removal 1037 long
  Length of dataset after removal 1035 long: 0% removed
Remove RADIANCE Data
  Length of dataset prior to removal 1037 long

Length of dataset after removal 1035 long: 0% removed
Remove ANCILLARY Data
Length of dataset prior to removal 1037 long
Length of dataset after removal 1035 long: 0% removed
L1BQC file produced:

/ssdwork/GitRepos/HyperInSPACE/Data/Sample_Data/L1BQC/SAMPLE_HYPERSAS_NOTRACKER_L1BQC.hdf
Process Single Level: /ssdwork/GitRepos/HyperInSPACE/Data/Sample_Data/L1BQC/SAMPLE_HYPERSAS_NOTRACKER_L1BQC.hdf - SUCCESSFUL
id: SATTHS0045
id: SATHSL0386
id: $GPRMC
id: SATHSE0488
id: SATHSL0385
id: SATMSG
id: SATPYR
id: SATHLD0385
id: SATIRP3397
id: SATHLD0386
id: $GPGGA
id: SATNAV0001
id: SATHED0488

File: SAMPLE_HYPERSAS_NOTRACKER Collected: Wed Aug 22 21:45:32 2018

L2 : Process L1BQC to L2

Apply temporal binning,station selection, glint correction,NIR corrections, reflectance calculation, and OC product calculation.

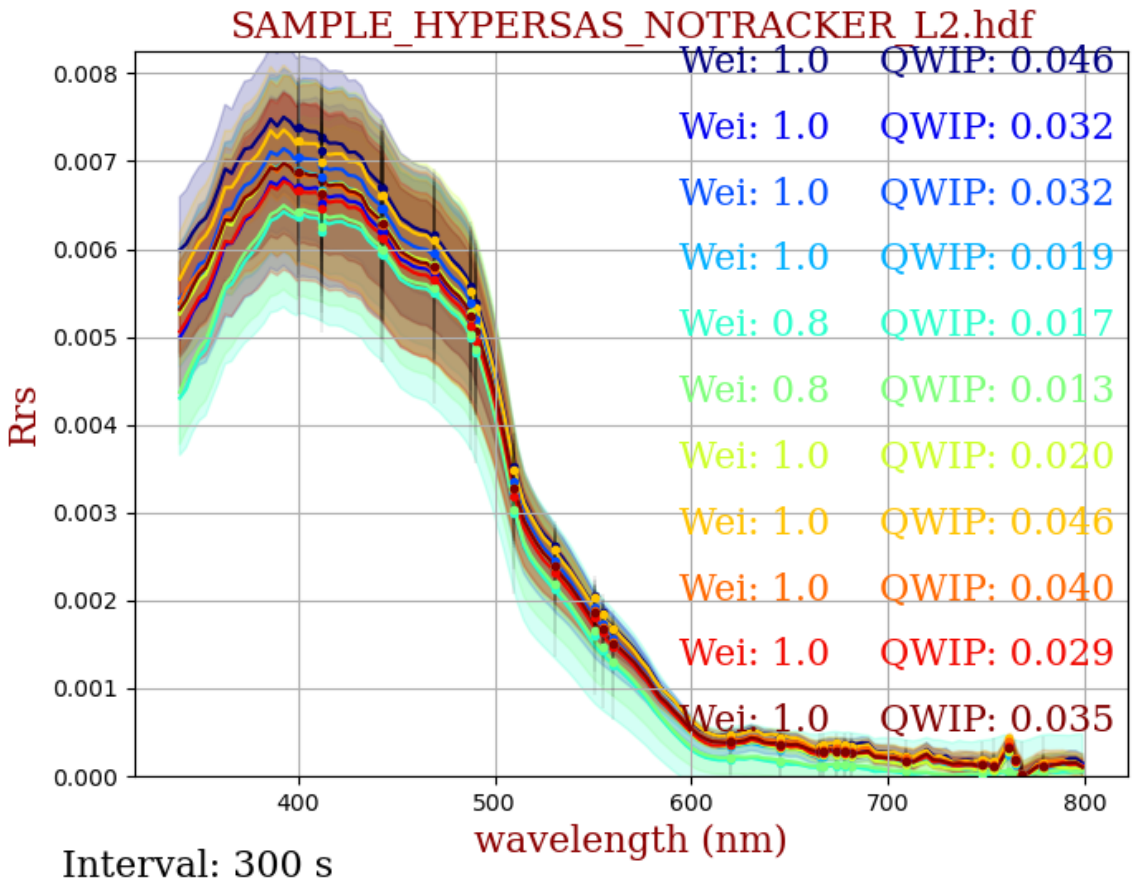
Processing Parameters:
Ensemble Duration: 300 sec
Glint_Correction: Mobley 1999
NIR Correction: Mueller and Austin 1995
Remove Negatives: ON

Process log:
Process Single Level
ProcessL2:
/ssdwork/GitRepos/HyperInSPACE/Data/Sample_Data/L1BQC/SAMPLE_HYPERSAS_NOTRACKER_L1BQC.hdf
Binning datasets to ensemble time interval.
109 spectra in slice (ensemble).
11 spectra remaining in slice to average after filtering to lowest 10.0%.
Calculating M99 glint correction with complete LUT
Perform simple residual NIR subtraction.
108 spectra in slice (ensemble).
11 spectra remaining in slice to average after filtering to lowest 10.0%.
Calculating M99 glint correction with complete LUT
Perform simple residual NIR subtraction.
111 spectra in slice (ensemble).
11 spectra remaining in slice to average after filtering to lowest 10.0%.
Calculating M99 glint correction with complete LUT
Perform simple residual NIR subtraction.
111 spectra in slice (ensemble).
11 spectra remaining in slice to average after filtering to lowest 10.0%.
Calculating M99 glint correction with complete LUT
Perform simple residual NIR subtraction.
94 spectra in slice (ensemble).
9 spectra remaining in slice to average after filtering to lowest 10.0%.
Calculating M99 glint correction with complete LUT
Perform simple residual NIR subtraction.
48 spectra in slice (ensemble).
5 spectra remaining in slice to average after filtering to lowest 10.0%.
Calculating M99 glint correction with complete LUT
Perform simple residual NIR subtraction.
93 spectra in slice (ensemble).
9 spectra remaining in slice to average after filtering to lowest 10.0%.
Calculating M99 glint correction with complete LUT
Perform simple residual NIR subtraction.
111 spectra in slice (ensemble).
11 spectra remaining in slice to average after filtering to lowest 10.0%.
Calculating M99 glint correction with complete LUT
Perform simple residual NIR subtraction.

110 spectra in slice (ensemble).
11 spectra remaining in slice to average after filtering to lowest 10.0%.
Calculating M99 glint correction with complete LUT
Perform simple residual NIR subtraction.
106 spectra in slice (ensemble).
11 spectra remaining in slice to average after filtering to lowest 10.0%.
Calculating M99 glint correction with complete LUT
Perform simple residual NIR subtraction.
34 spectra in slice (ensemble).
3 spectra remaining in slice to average after filtering to lowest 10.0%.
Calculating M99 glint correction with complete LUT
Perform simple residual NIR subtraction.
Filtering reflectance spectra for negative values.
0.0% of Rrs_HYPER spectra flagged
0.0% of nLw_HYPER spectra flagged
Processing chlor_a
Processing poc
Processing kd490
Processing Wei QA
Processing avw
Processing QWIP
Processing CDOM, Sg, DOC
Processing qaa
L2 file produced:
/ssdwork/GitRepos/HyperInSPACE/Data/Sample_Data/L2/SAMPLE_HYPERSAS_NOTRACKER_L2.hdf
Output SeaBASS for HDF:
/ssdwork/GitRepos/HyperInSPACE/Data/Sample_Data/L2/SAMPLE_HYPERSAS_NOTRACKER_L2.hdf

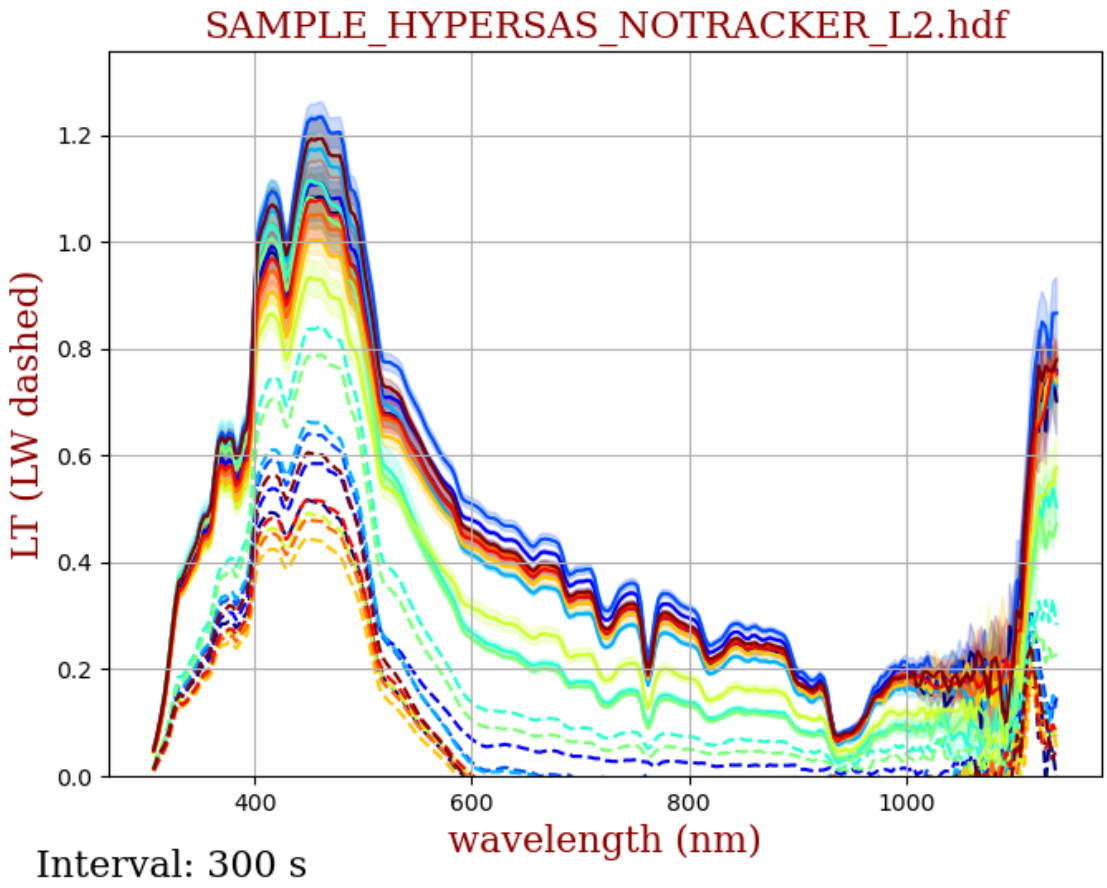
Radiometry

File: SAMPLE_HYPERSAS_NOTRACKER Collected: Wed Aug 22 21:45:32 2018



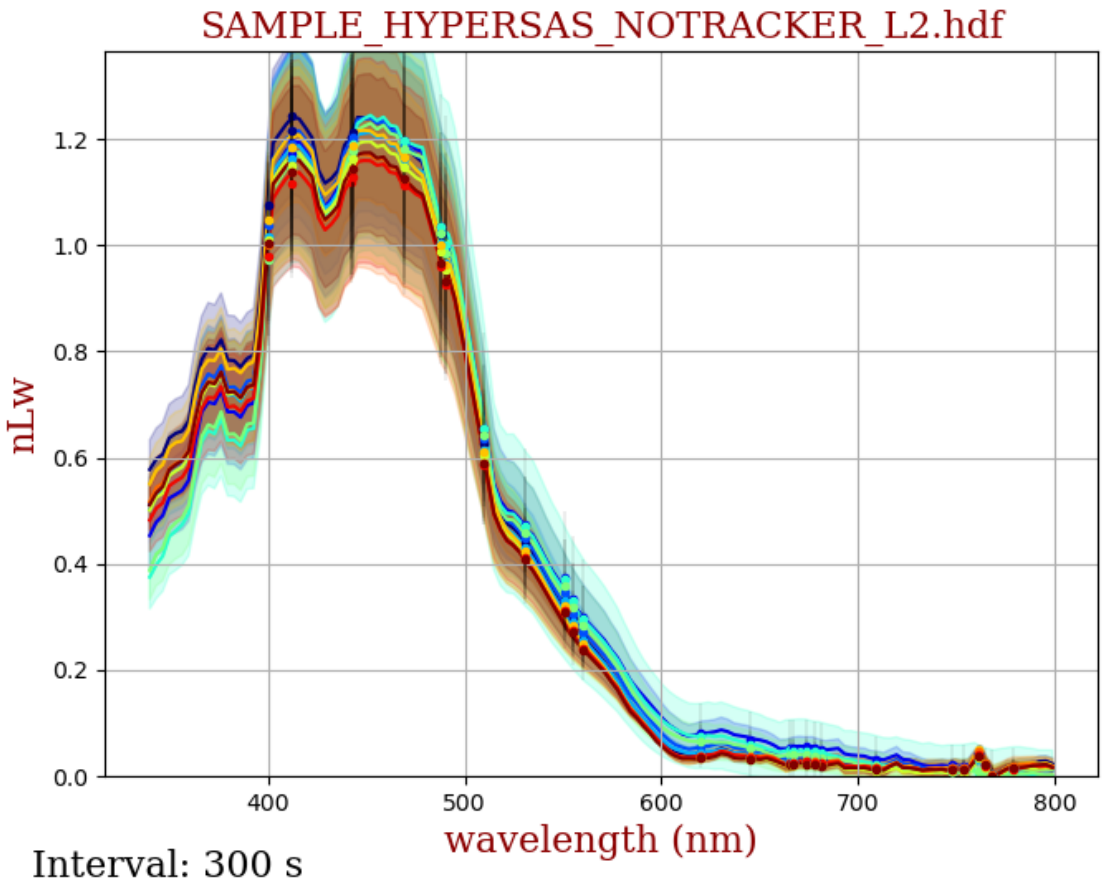
Interval: 300 s

File: SAMPLE_HYPERSAS_NOTRACKER Collected: Wed Aug 22 21:45:32 2018



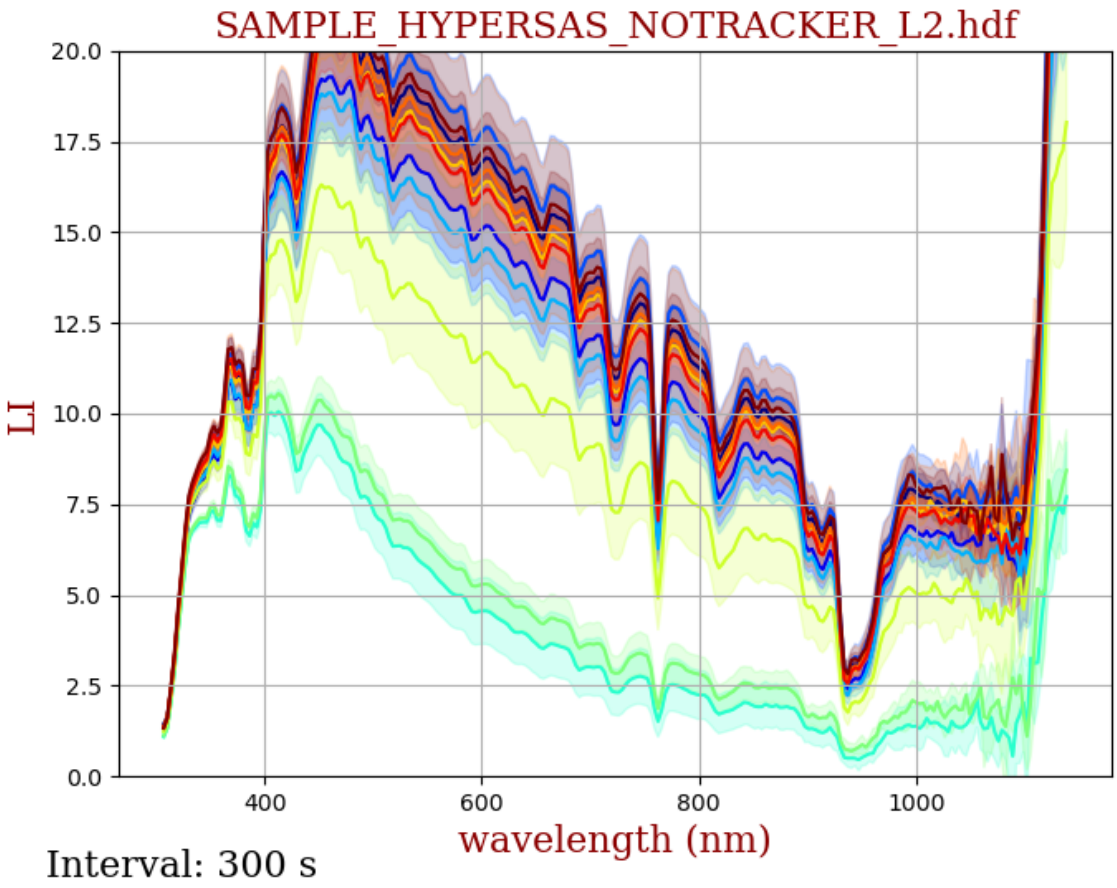
Interval: 300 s

File: SAMPLE_HYPERSAS_NOTRACKER Collected: Wed Aug 22 21:45:32 2018



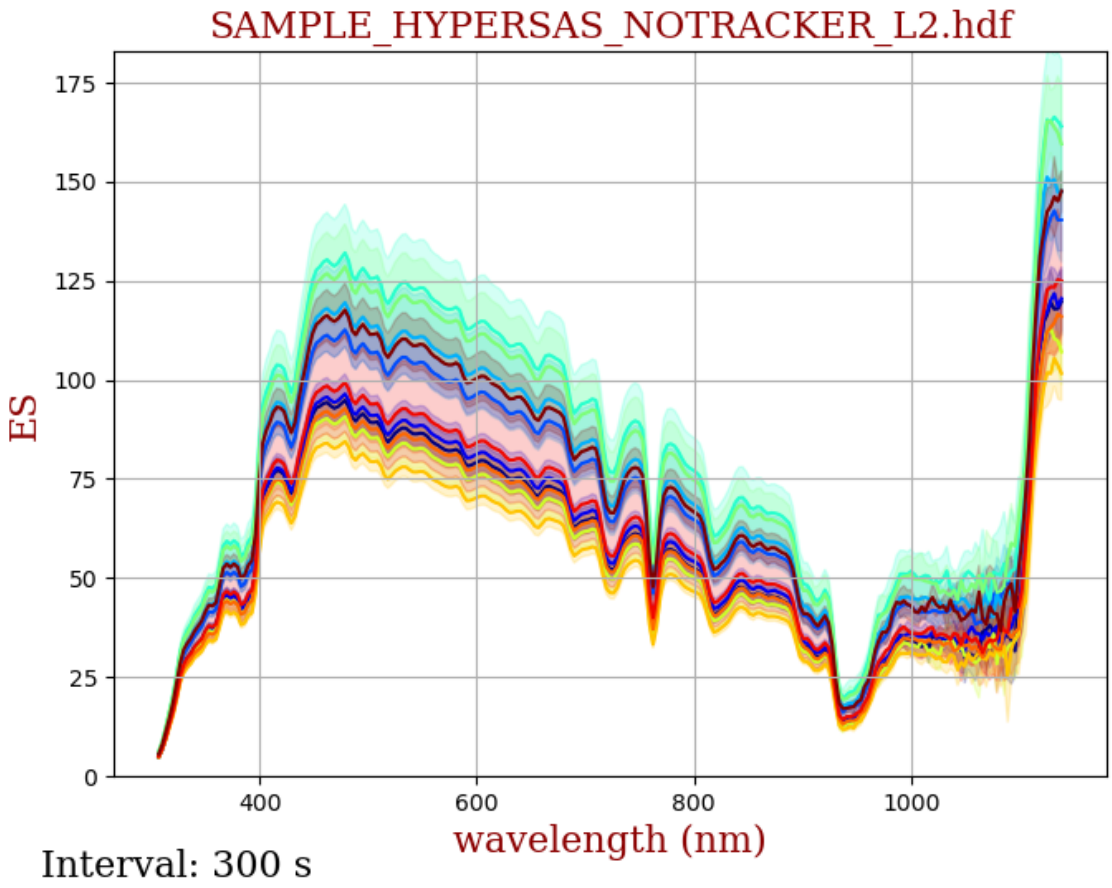
Interval: 300 s

File: SAMPLE_HYPERSAS_NOTRACKER Collected: Wed Aug 22 21:45:32 2018



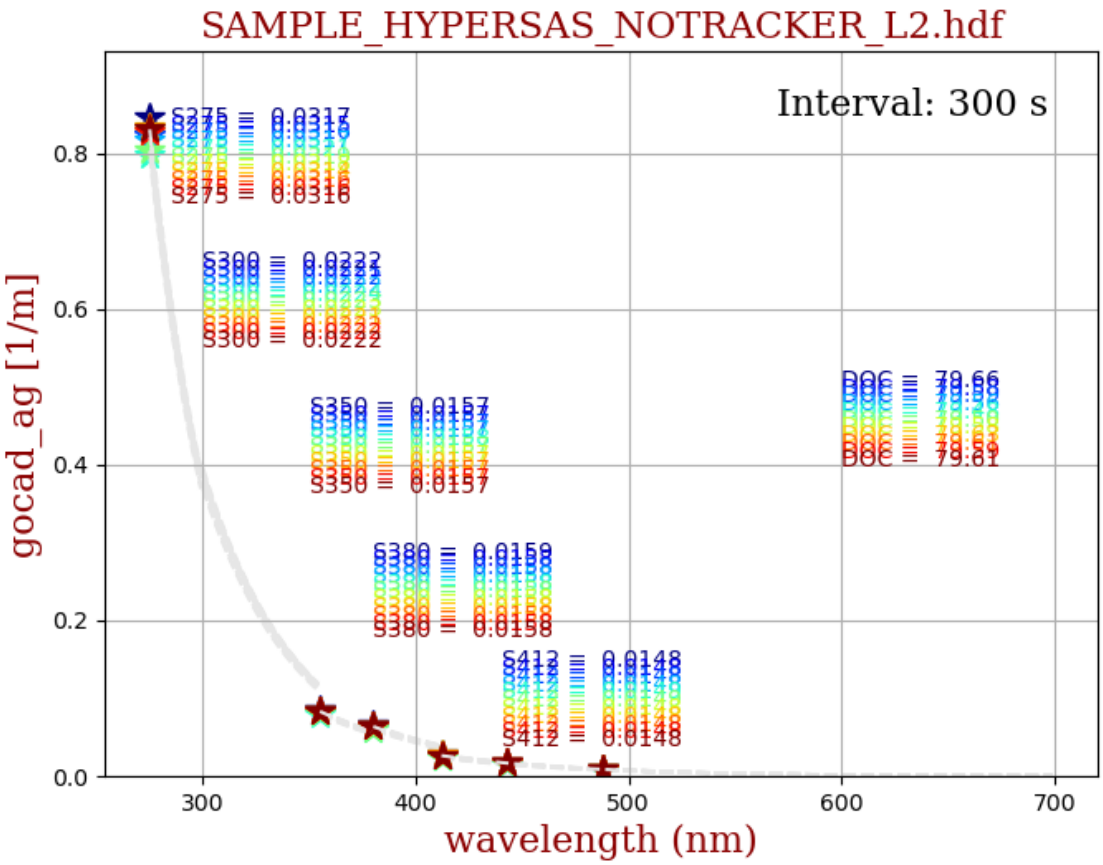
Interval: 300 s

File: SAMPLE_HYPERSAS_NOTRACKER Collected: Wed Aug 22 21:45:32 2018

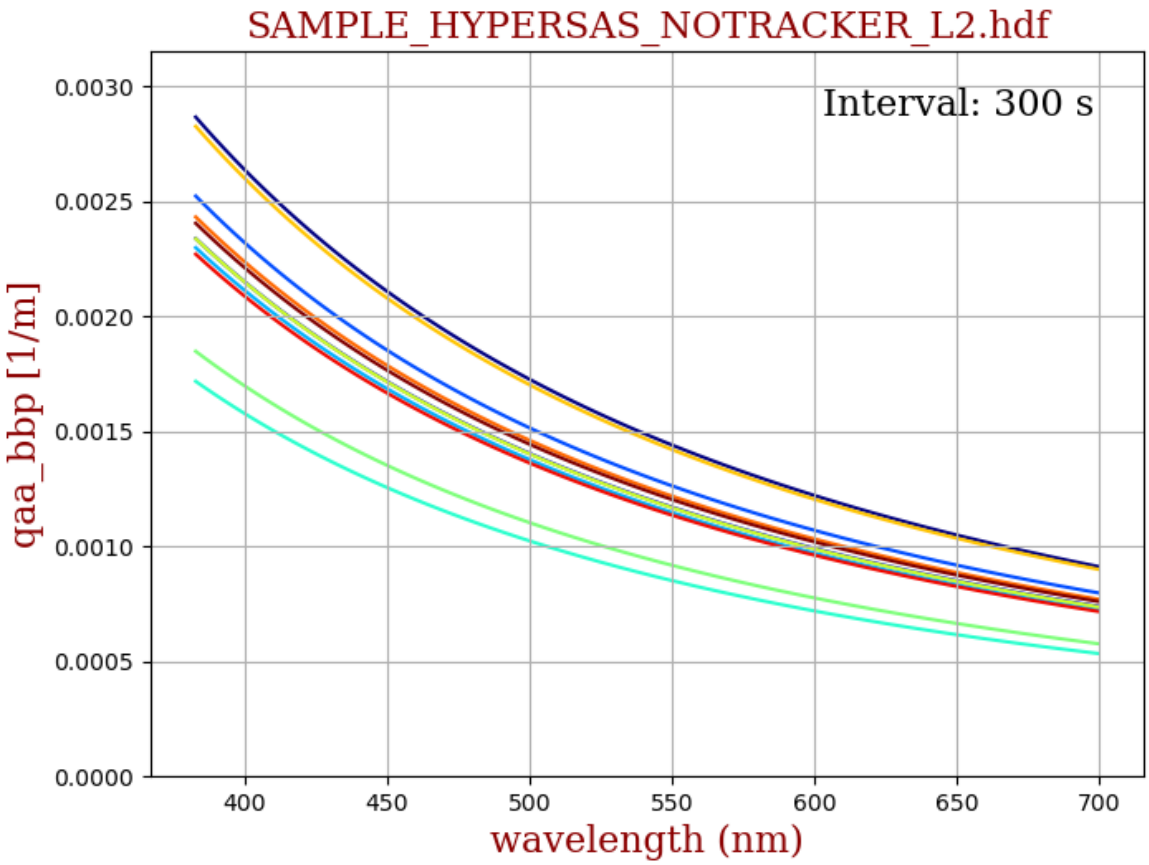


Derived Spectral Products

File: SAMPLE_HYPERSAS_NOTRACKER Collected: Wed Aug 22 21:45:32 2018



File: SAMPLE_HYPERSAS_NOTRACKER Collected: Wed Aug 22 21:45:32 2018



File: SAMPLE_HYPERSAS_NOTRACKER Collected: Wed Aug 22 21:45:32 2018