File: SAMPLE_HYPERSAS_NOTRACKER Collected: Sun Sep 08 13:30:27 2019

L1A : Process RAW to L1A

Raw binary to HDF5 and filter data on SZA.

Processing Parameters and metadata:
HyperInSPACE version: 1.0.9
SZA Filter (L1A): 70.0

The stuff that dreams are made of.
/version=R0
/investigators=Sam_Spade
/affiliations=Sam_Spade_Detective_Agency
/contact=supersleuth@noir.com
/experiment=sample
/cruise=Sample1
/documents=LogSheet.xls,ProcessReport.xls
/instrument_manufacturer=Satlantic
/instrument_model=HyperSAS
/calibration_date=
/calibration_files=HSE488B.cal,HSL386B.cal,HLD386B.cal,HED488B.cal,SATTHS0045A.tdf,HLD385B.cal
,HSL385B.cal,SATNAV0001A.tdf,GPRMC_NMEA0183v3.01.tdf
/data_type=above_water
/data_status=preliminary
/measurement_depth=0

Process log:
Process Single Level
ProcessL1a.processL1a: 01-Nov-2021 14:37:39
L1A file produced:
/Users/daurin/GitRepos/HyperInSPACE/Data/L1A/SAMPLE_HYPERSAS_NOTRACKER_L1A.hdf
Process Single Level:
/Users/daurin/GitRepos/HyperInSPACE/Data/L1A/SAMPLE_HYPERSAS_NOTRACKER_L1A.hdf -
SUCCESSFUL

File: SAMPLE_HYPERSAS_NOTRACKER Collected: Sun Sep 08 13:30:27 2019

L1B : Process L1A to L1B

Apply factory calibrations.

Processing Parameters: None

Process log:
Process Single Level
ProcessL1b.processL1b: 01-Nov-2021 14:37:43
Applying factory calibrations.
  Group: GPGGA_NMEA0183.tdf
    File: $GPGGA
  Group: HED488B.cal
    File: SATHED0488
  Group: HLD385B.cal
    File: SATHLD0385
  Group: HLD386B.cal
    File: SATHLD0386
  Group: HSE488B.cal
    File: SATHSE0488
  Group: HSL385B.cal
    File: SATHSL0385
  Group: HSL386B.cal
    File: SATHSL0386
L1B file produced:
 /Users/daurin/GitRepos/HyperInSPACE/Data/L1B/SAMPLE_HYPERSAS_NOTRACKER_L1B.hdf
Process Single Level: /Users/daurin/GitRepos/HyperInSPACE/Data/L1B/SAMPLE_HYPERSAS_NOTRACKER_L1B.hdf - SUCCESSFUL

File: SAMPLE_HYPERSAS_NOTRACKER Collected: Sun Sep 08 13:30:27 2019

L1C : Process L1B to L1C

Filter data on pitch, roll, yaw, and azimuth angles.

Processing Parameters:
Rotator Home Angle: 0.0
Rotator Delay: 60.0
Rel Azimuth Min: 90.0
Rel Azimuth Max: 135.0

Process log:
Process Single Level
Found data: station
Found data: lat
Found data: lon
Found data: speed_f_w
Found data: wind
Found data: wt
Found data: sal
Found data: cloud
Found data: waveht
Found data: heading
Found data: relaz
ProcessL1c:
/Users/daurin/GitRepos/HyperInSPACE/Data/L1B/SAMPLE_HYPERSAS_NOTRACKER_L1B.hdf
ProcessL1c.processL1c: 01-Nov-2021 14:37:45
Filtering file for bad Relative Solar Azimuth
Percentage of data out of Relative Solar Azimuth bounds: 0 %
Eliminate combined filtered data from datasets.******************************
Remove ES_DARK Data
  Length of dataset prior to removal 118 long
  Length of records removed from dataset: 0
  Data end 118 long, a loss of 0 %
Remove ES_LIGHT Data
  Length of dataset prior to removal 500 long
  Length of records removed from dataset: 0
  Data end 500 long, a loss of 0 %
Remove GPGGA_NMEA0183.tdf Data
  Length of dataset prior to removal 372 long
  Length of records removed from dataset: 0
  Data end 372 long, a loss of 0 %
Remove LI_DARK Data
  Length of dataset prior to removal 88 long
  Length of records removed from dataset: 0
  Data end 88 long, a loss of 0 %
Remove LI_LIGHT Data
  Length of dataset prior to removal 405 long
  Length of records removed from dataset: 0
  Data end 405 long, a loss of 0 %

Remove LT_DARK Data
  Length of dataset prior to removal 27 long
  Length of records removed from dataset: 0
  Data end 27 long, a loss of 0 %
Remove LT_LIGHT Data
  Length of dataset prior to removal 137 long
  Length of records removed from dataset: 0
  Data end 137 long, a loss of 0 %
Remove ANCILLARY_METADATA Data
  Length of dataset prior to removal 5 long
  Length of records removed from dataset: 0
  Data end 5 long, a loss of 0 %
L1C file produced:
/Users/daurin/GitRepos/HyperInSPACE/Data/L1C/SAMPLE_HYPERSAS_NOTRACKER_L1C.hdf
Process Single Level: /Users/daurin/GitRepos/HyperInSPACE/Data/L1C/SAMPLE_HYPERSAS_NOTRACKER_L1C.hdf - SUCCESSFUL

L1D : Process L1C to L1D

Deglitch data and apply shutter dark corrections.

Processing Parameters:
ES Dark Window: 11
ES Light Window: 9
ES Dark Sigma: 3.2
ES Light Sigma: 2.4
LT Dark Window: 9
LT Light Window: 9
LT Dark Sigma: 3.2
LT Light Sigma: 2.3
LI Dark Window: 11
LI Light Window: 9
LI Dark Sigma: 3.5
LI Light Sigma: 2.4
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: 421.63
LI Light Min.: 5.6
LI Light Max.: None
LI Dark Thresh. Band: None
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

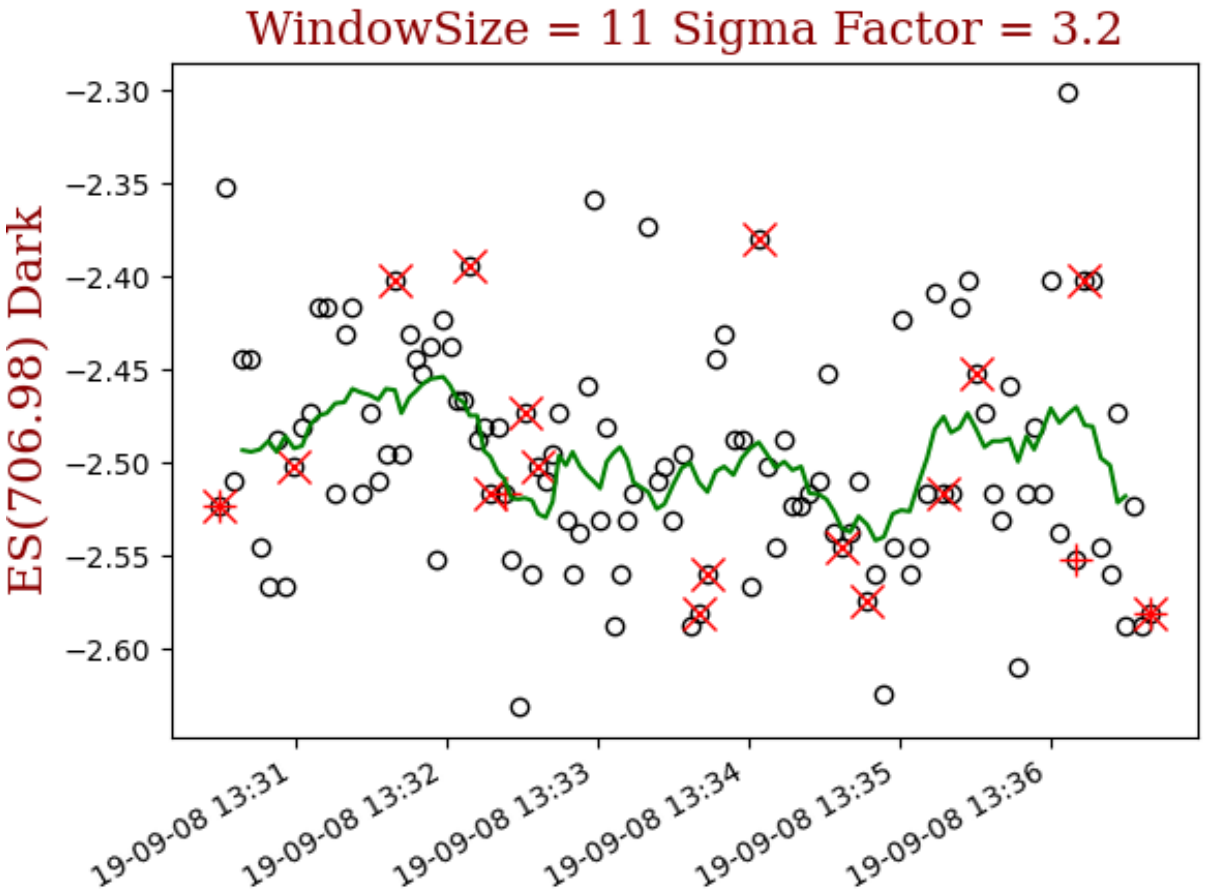
Process log:
Process Single Level
No deglitching parameter file found. Resorting to values in ConfigFile.settings.
ProcessL1d:
/Users/daurin/GitRepos/HyperInSPACE/Data/L1C/SAMPLE_HYPERSAS_NOTRACKER_L1C.hdf
ProcessL1d.processL1d: 01-Nov-2021 14:37:46
Screening ANCILLARY_METADATA for clean timestamps.
Screening ES_DARK for clean timestamps.
Screening ES_LIGHT for clean timestamps.
Screening GPGGA_NMEA0183.tdf for clean timestamps.
Out of order TIMETAG2 row deleted at 161
Out of order TIMETAG2 row deleted at 165
Out of order TIMETAG2 row deleted at 169

Out of order TIMETAG2 row deleted at 172
Out of order TIMETAG2 row deleted at 183
Out of order TIMETAG2 row deleted at 213
Out of order TIMETAG2 row deleted at 336
Data eliminated for non-increasing timestamps: 1.9%
Screening LI_DARK for clean timestamps.
Screening LI_LIGHT for clean timestamps.
Screening LT_DARK for clean timestamps.
Screening LT_LIGHT for clean timestamps.
ES
Deglitching dark
Data reduced by 18 (15%)
Deglitching light
Data reduced by 134 (27%)
LI
Deglitching dark
Data reduced by 3 (3%)
Deglitching light
Data reduced by 261 (64%)
LT
Deglitching dark
Data reduced by 4 (15%)
Deglitching light
Data reduced by 11 (8%)
Dark Correction: ES
Dark Correction: LI
Dark Correction: LT
L1D file produced:
/Users/daurin/GitRepos/HyperInSPACE/Data/L1D/SAMPLE_HYPERSAS_NOTRACKER_L1D.hdf
Process Single Level: /Users/daurin/GitRepos/HyperInSPACE/Data/L1D/SAMPLE_HYPERSAS_NOTRACKER_L1D.hdf - SUCCESSFUL

Example Deglitching

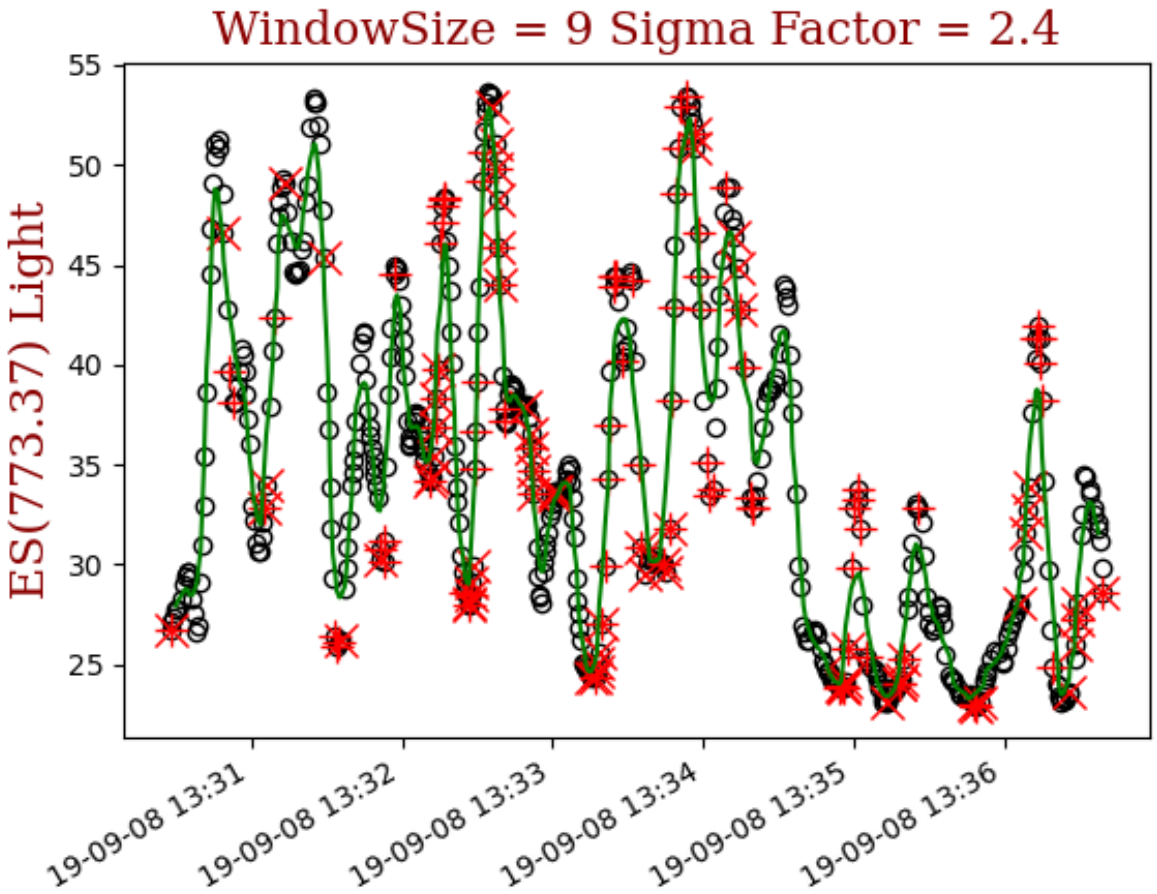
Randomized. Complete plots of hyperspectral deglitching from anomaly analysis can be found in [output_directory]/Plots/L1C_Anoms.

Marked for exclusions in ALL bands



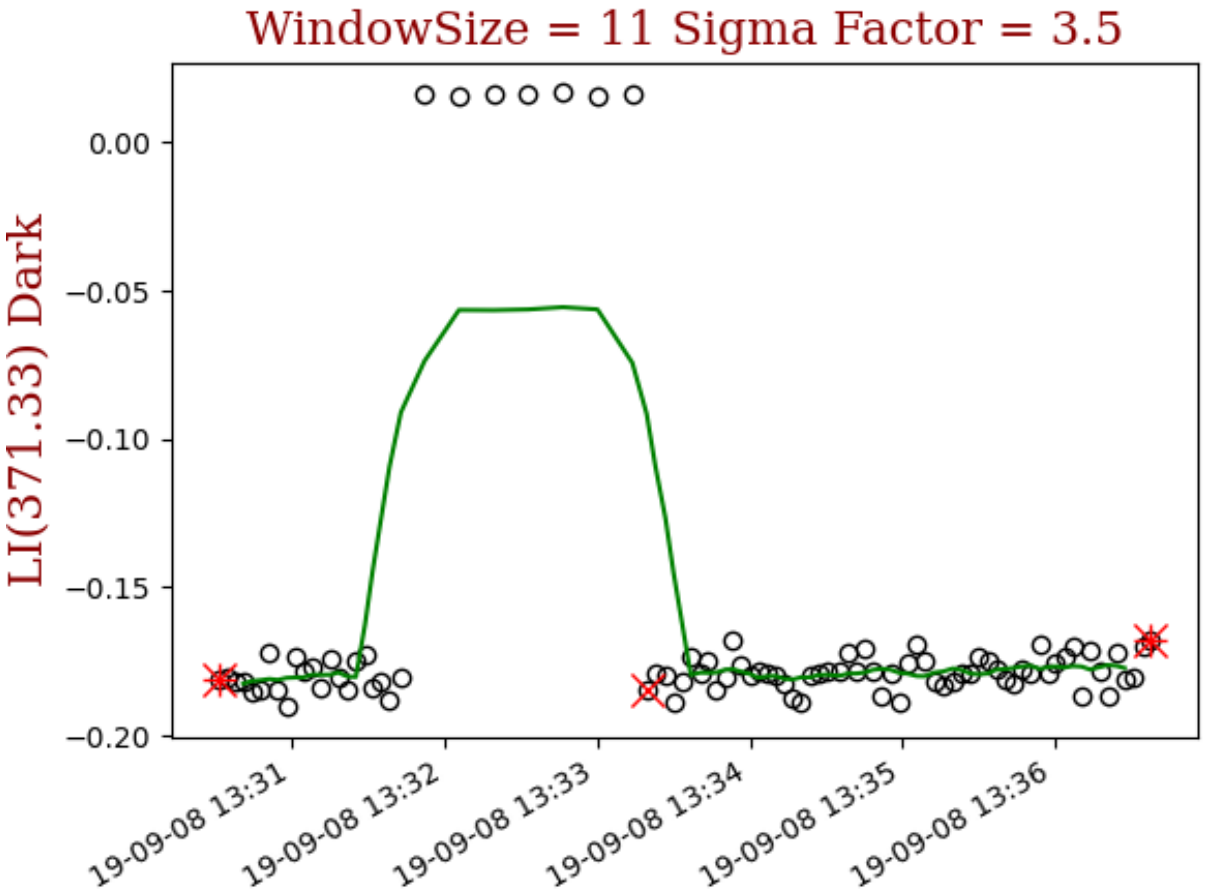
File: SAMPLE_HYPERSAS_NOTRACKER Collected: Sun Sep 08 13:30:27 2019

Marked for exclusions in ALL bands



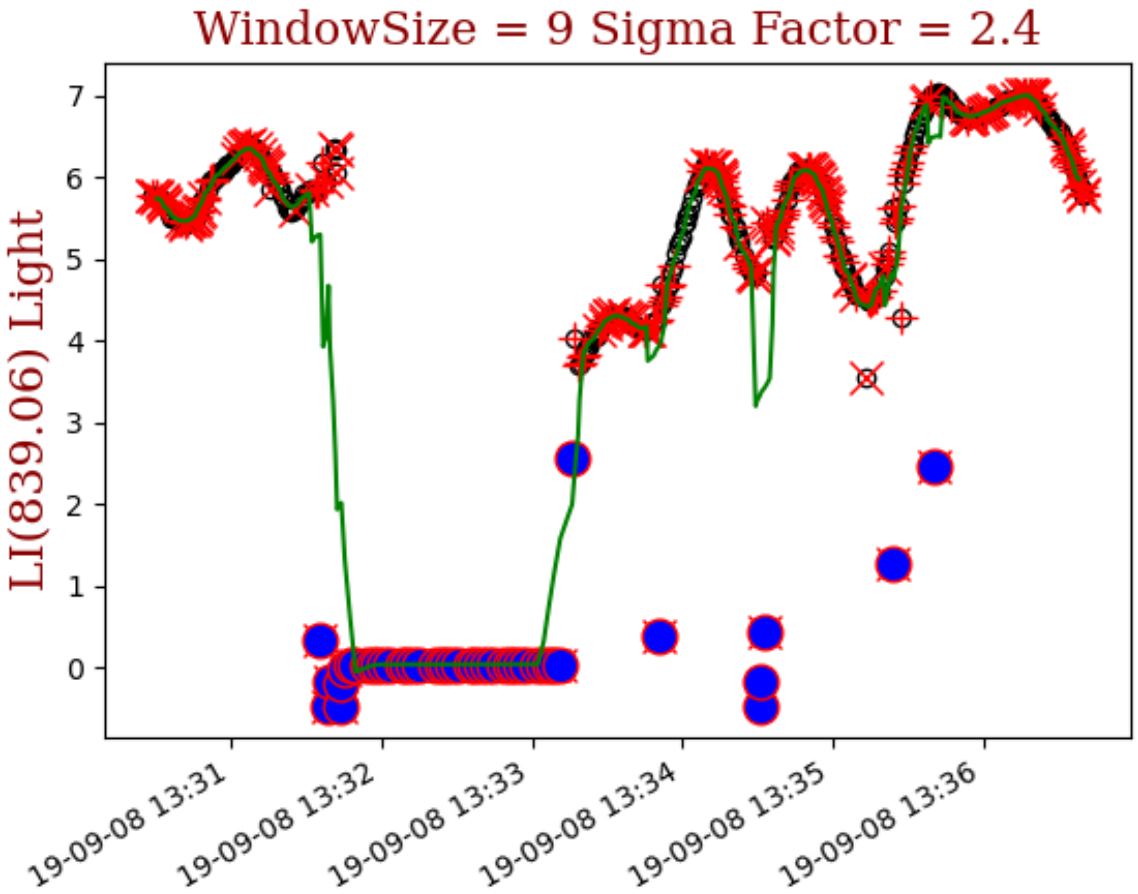
File: SAMPLE_HYPERSAS_NOTRACKER Collected: Sun Sep 08 13:30:27 2019

Marked for exclusions in ALL bands



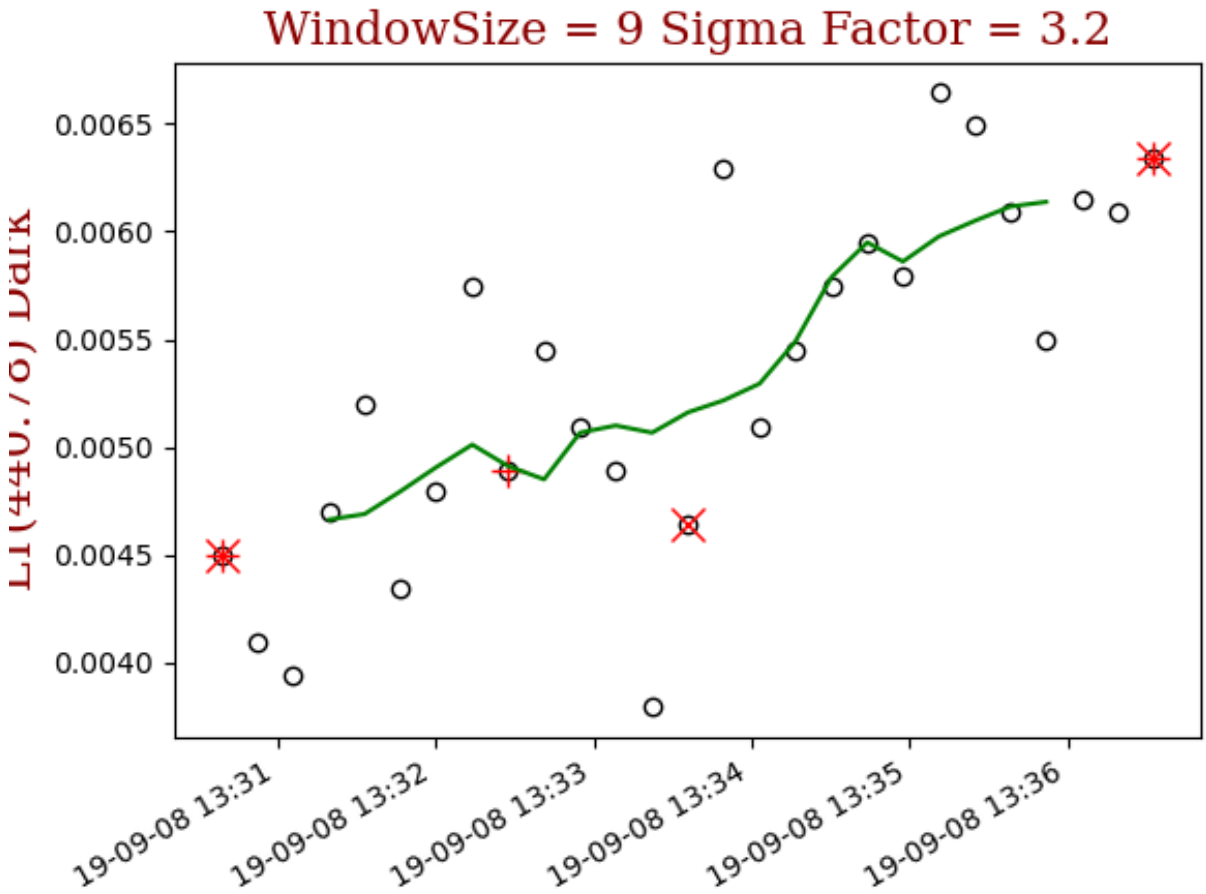
File: SAMPLE_HYPERSAS_NOTRACKER Collected: Sun Sep 08 13:30:27 2019

Marked for exclusions in ALL bands



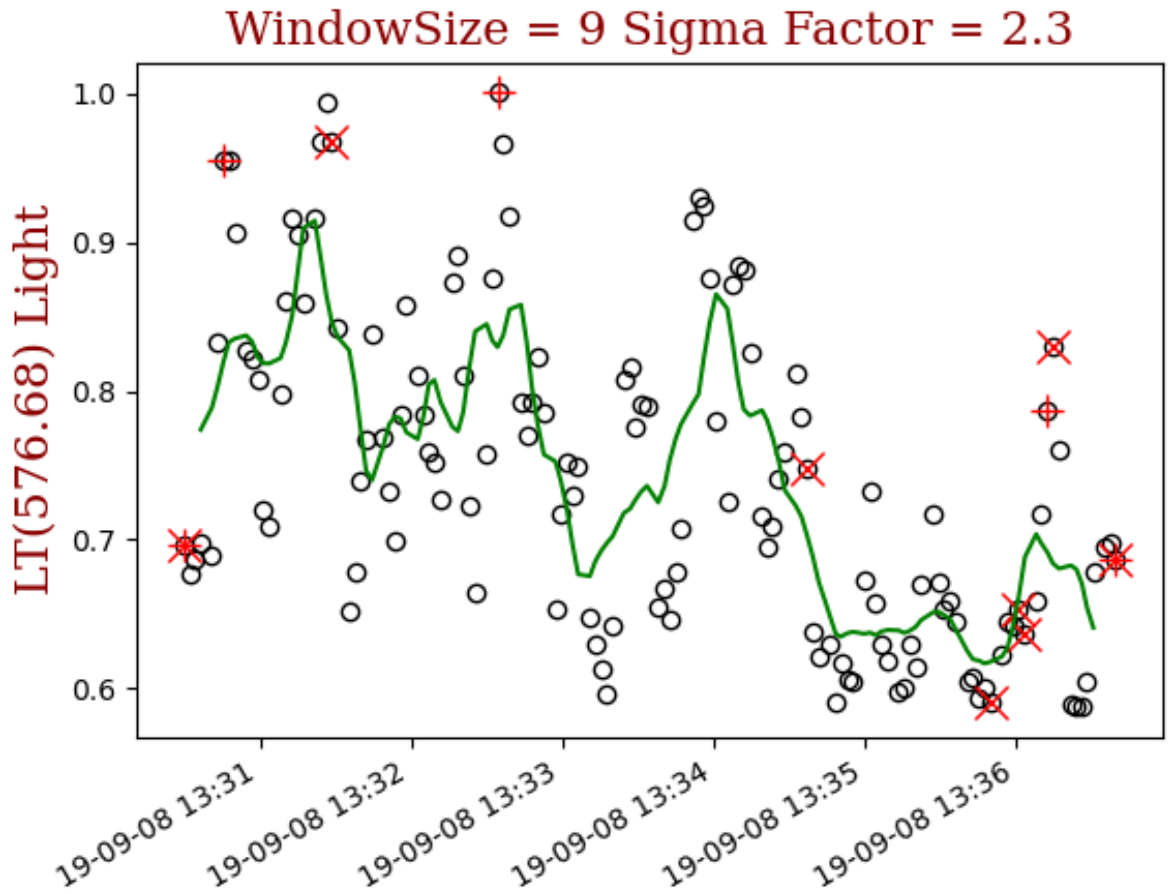
File: SAMPLE_HYPERSAS_NOTRACKER Collected: Sun Sep 08 13:30:27 2019

Marked for exclusions in ALL bands



File: SAMPLE_HYPERSAS_NOTRACKER Collected: Sun Sep 08 13:30:27 2019

Marked for exclusions in ALL bands



File: SAMPLE_HYPERSAS_NOTRACKER Collected: Sun Sep 08 13:30:27 2019

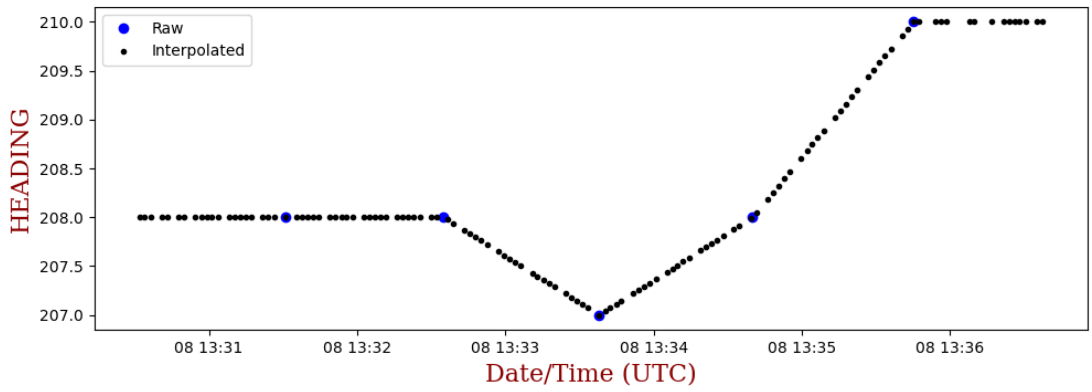
L1E : Process L1D to L1E

Interpolate data to common timestamps and wavebands.
Processing Parameters:
Wavelength Interp Int: 3.3 nm

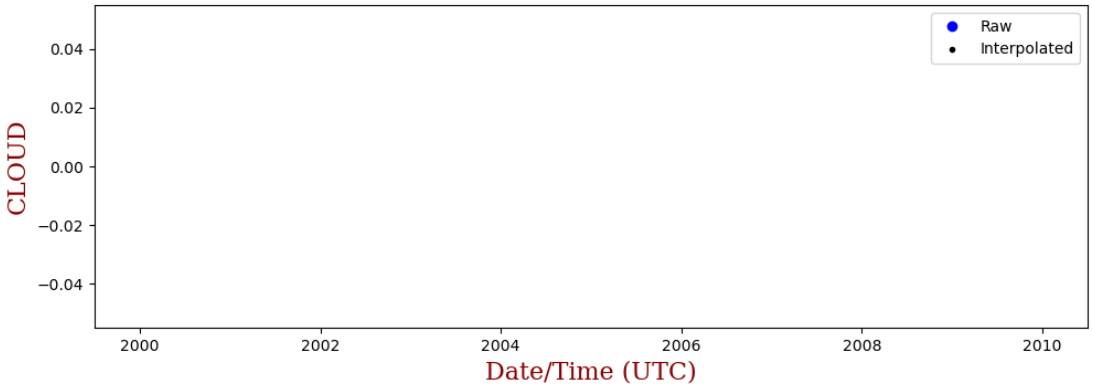
Process log:
Process Single Level
ProcessL1e.processL1e: 01-Nov-2021 14:38:04
LT has fewest records (as expected) - interpolating to LT; 126 records
Interpolate Data ES
Interpolate Data LI
Interpolate Data LT
Skip. Other instruments are being interpolated to this one.
Interpolate Data LATITUDE
Interpolate Data LONGITUDE
Interpolate Data REL_AZ
Interpolate Data SZA
Interpolate Data STATION
Interpolate Data HEADING
Interpolate Data LATITUDE
Interpolate Data LONGITUDE
Interpolate Data SALINITY
Interpolate Data SOLAR_AZ
Interpolate Data SST
Interpolate Data WINDSPEED
Interpolate Data CLOUD
Interpolate Data WAVE_HT
Interpolate Data SPEED_F_W
L1E file produced:
/Users/daurin/GitRepos/HyperInSPACE/Data/L1E/SAMPLE_HYPERSAS_NOTRACKER_L1E.hdf
Output SeaBASS for HDF: Es, Li, Lt files

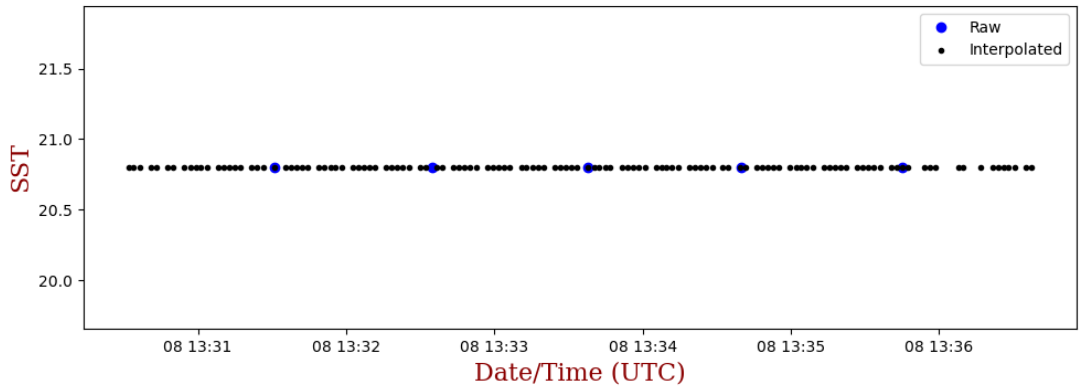
Example Temporal Interpolations

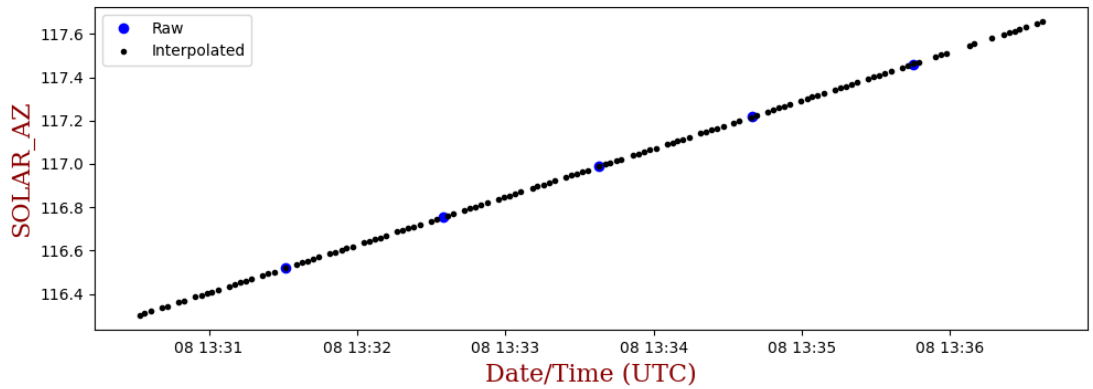
Randomized. Complete plots of hyperspectral interpolations can be found in [output_directory]/Plots/L1E.

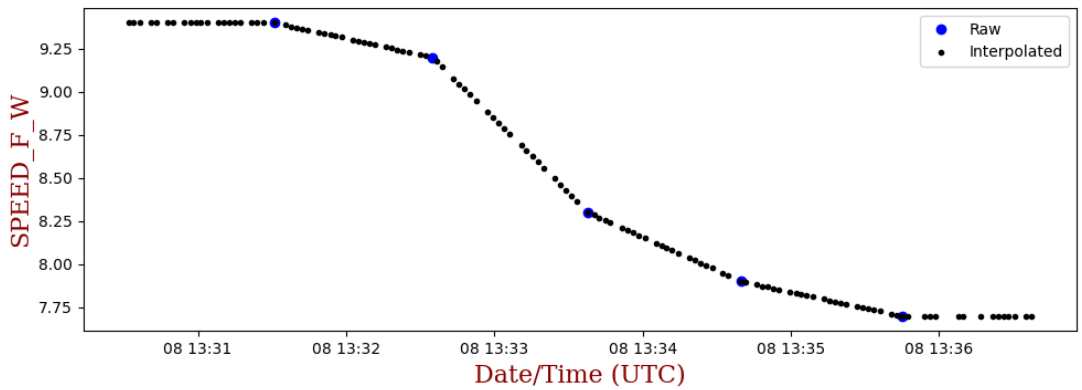


File: SAMPLE_HYPERSAS_NOTRACKER Collected: Sun Sep 08 13:30:27 2019

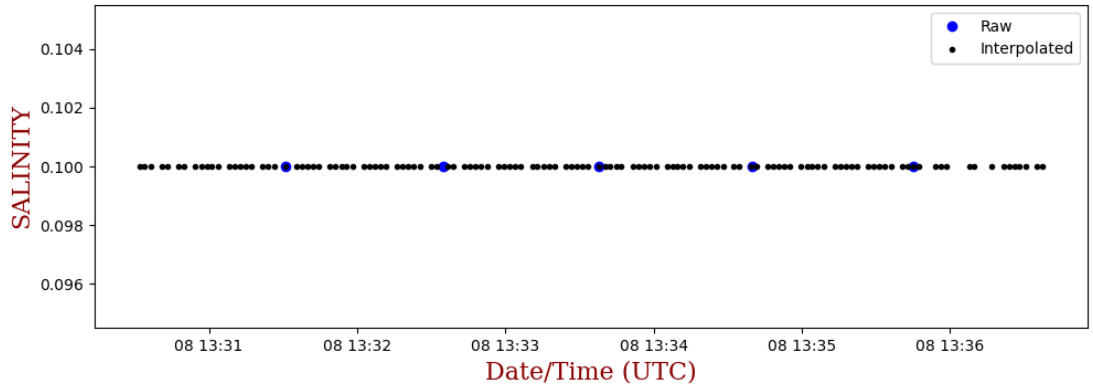


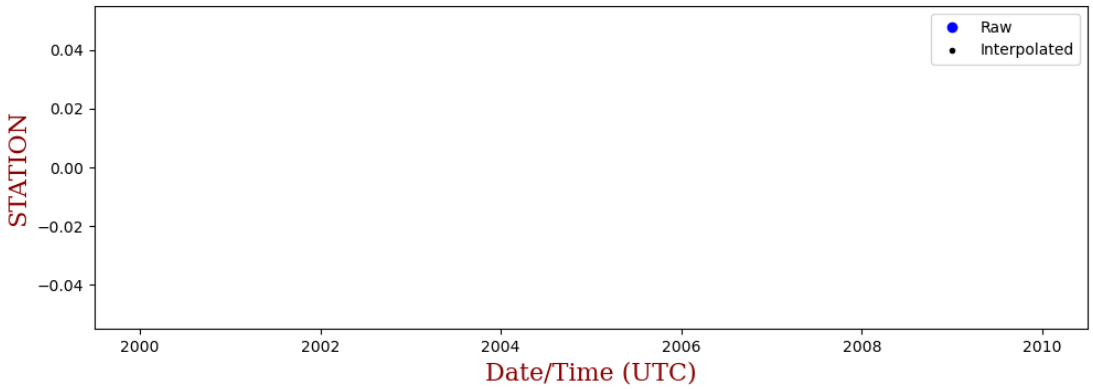


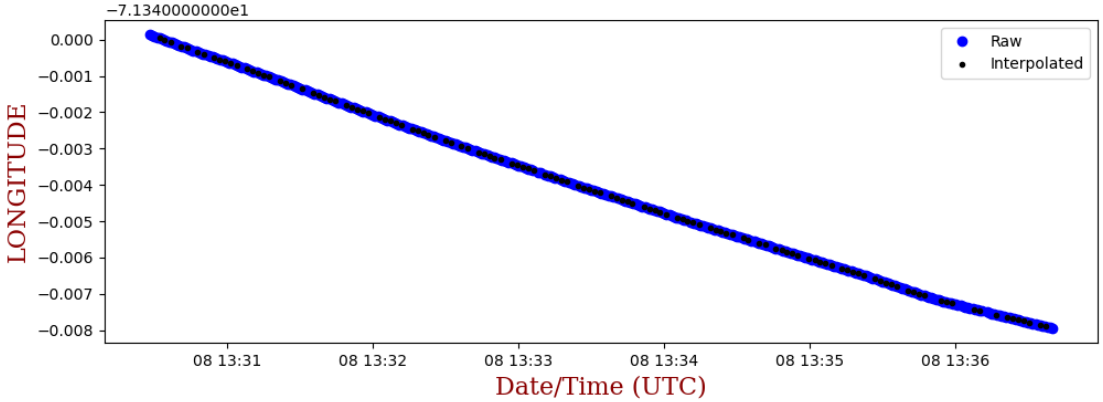


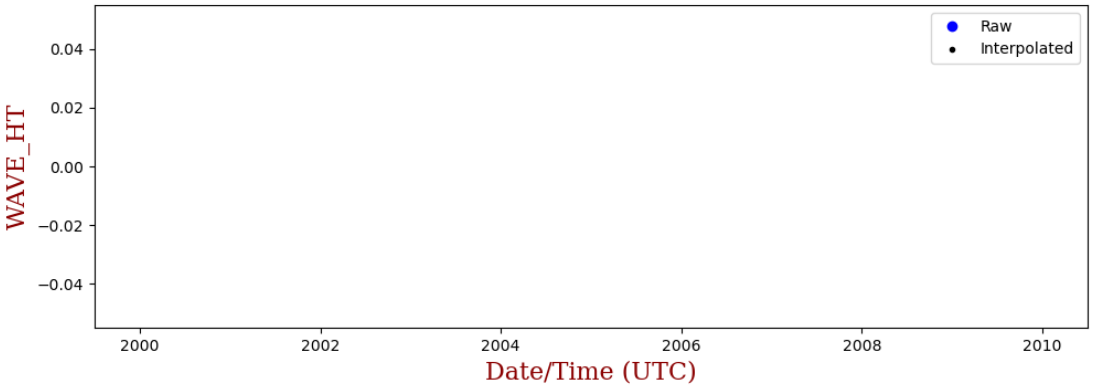


File: SAMPLE_HYPERSAS_NOTRACKER Collected: Sun Sep 08 13:30:27 2019

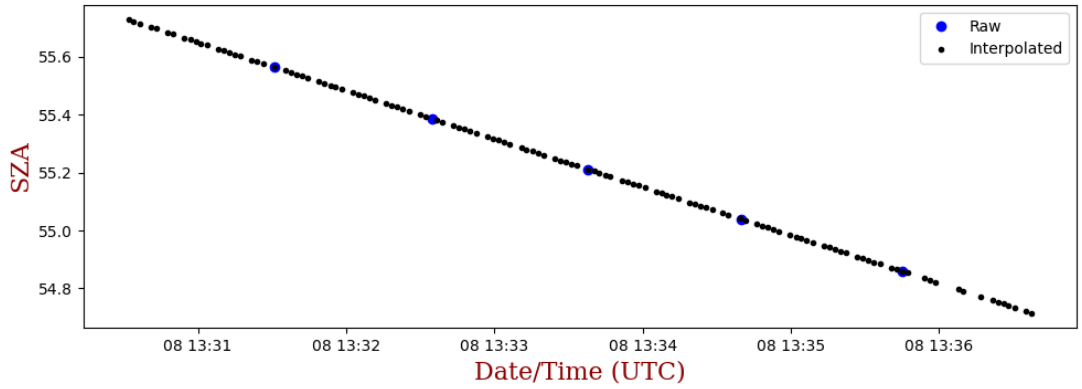


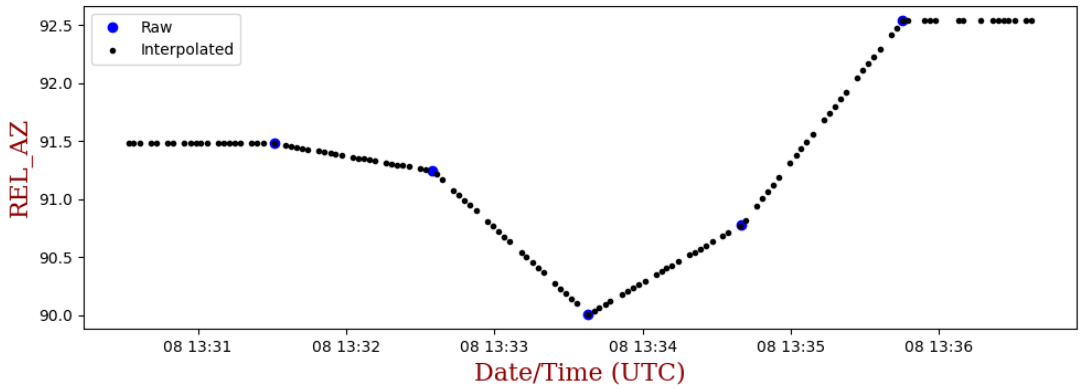


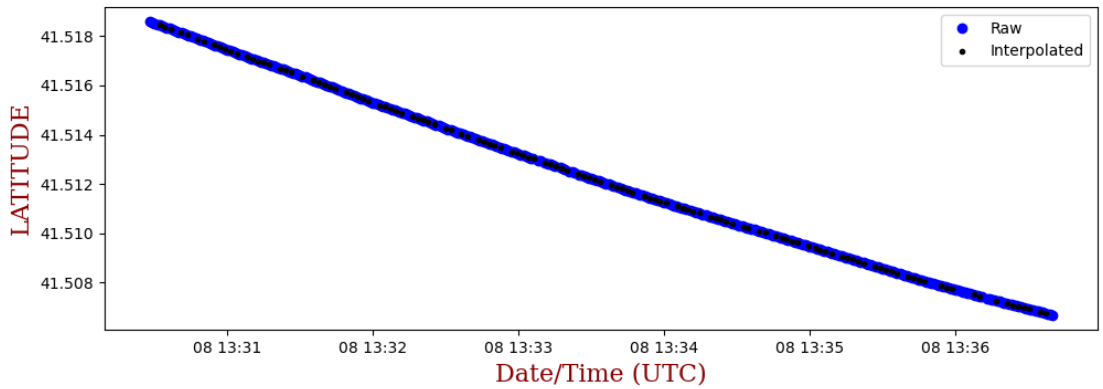


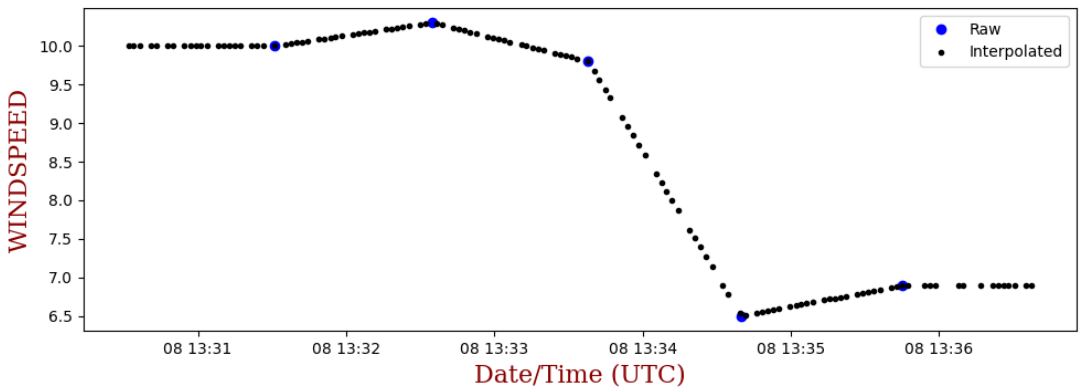


File: SAMPLE_HYPERSAS_NOTRACKER Collected: Sun Sep 08 13:30:27 2019

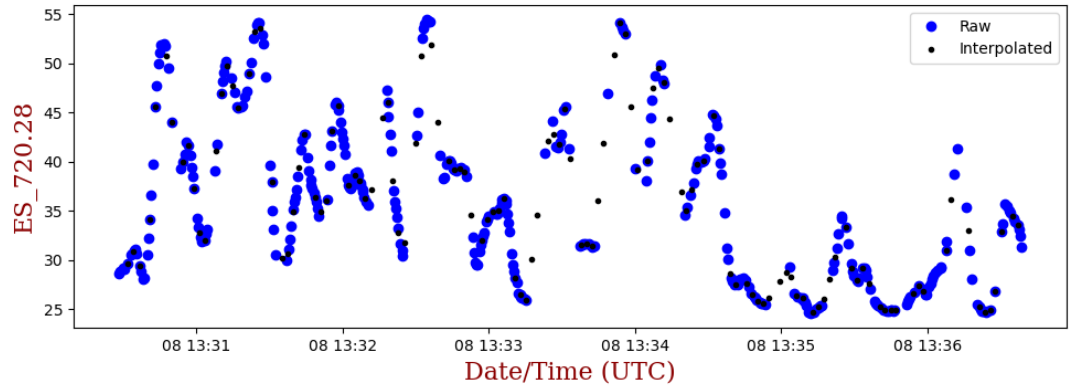


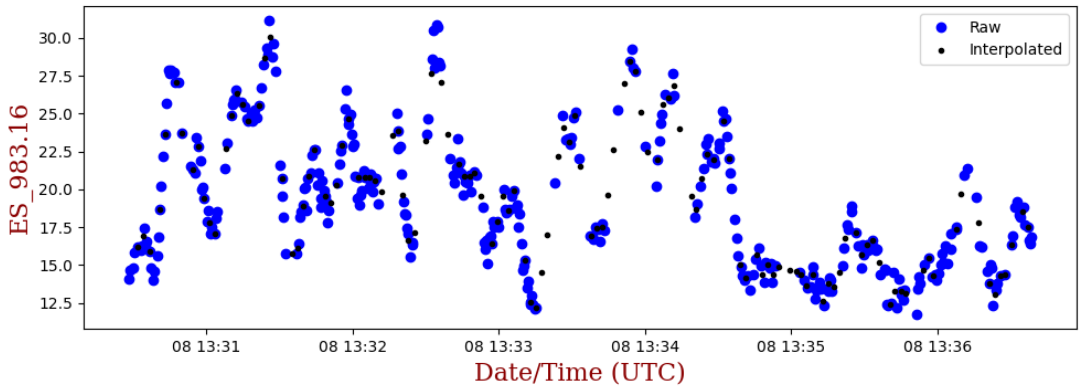


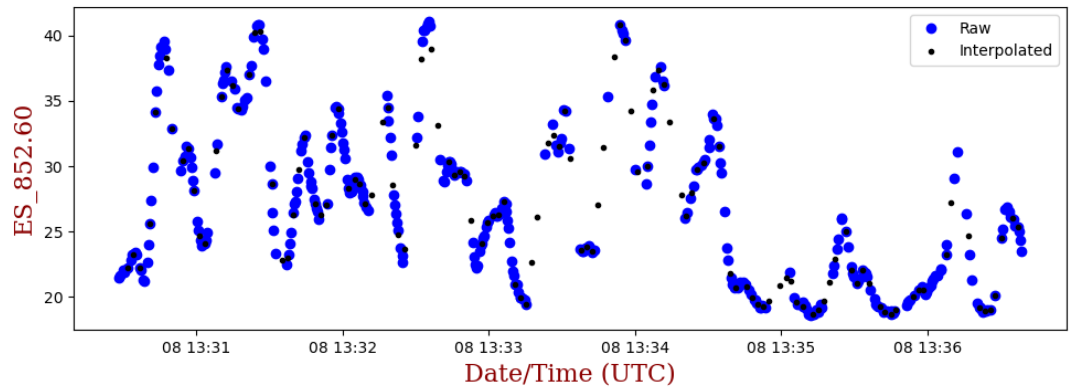


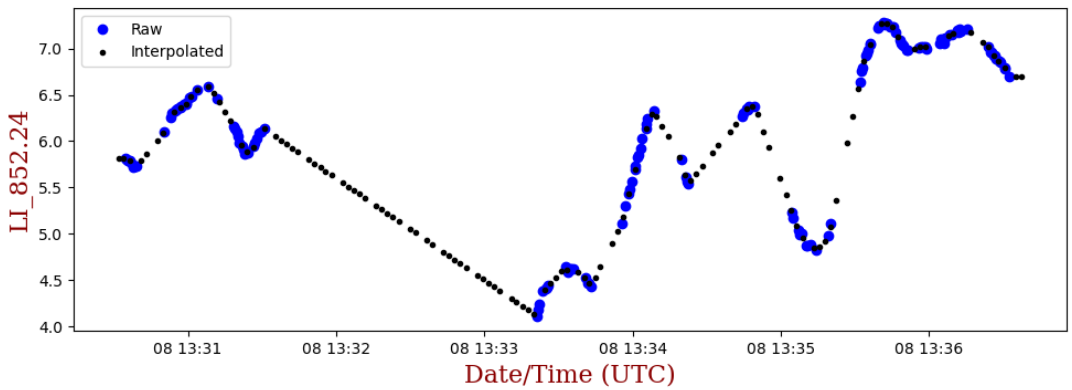


File: SAMPLE_HYPERSAS_NOTRACKER Collected: Sun Sep 08 13:30:27 2019

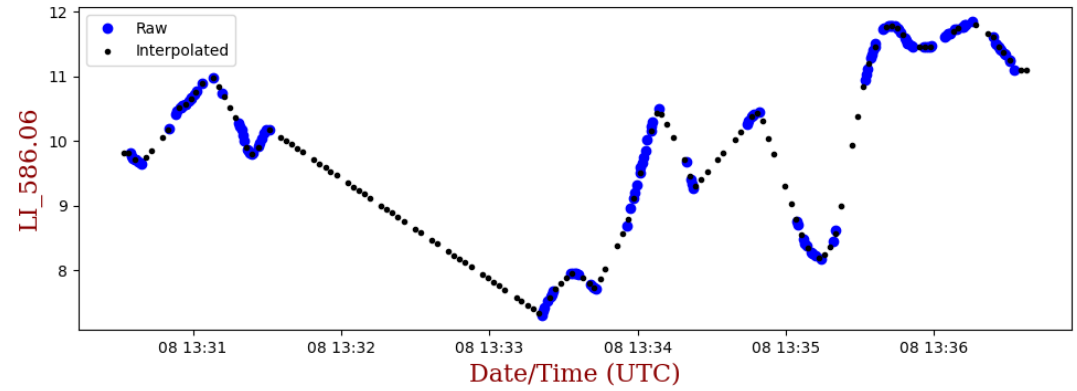


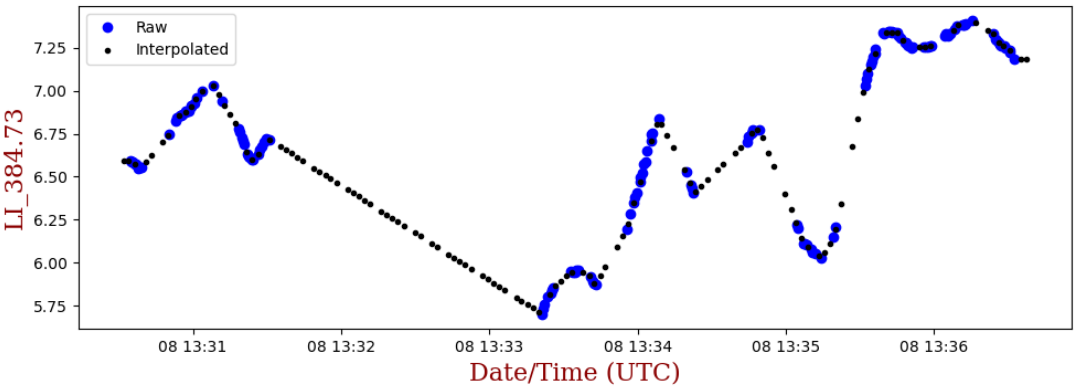






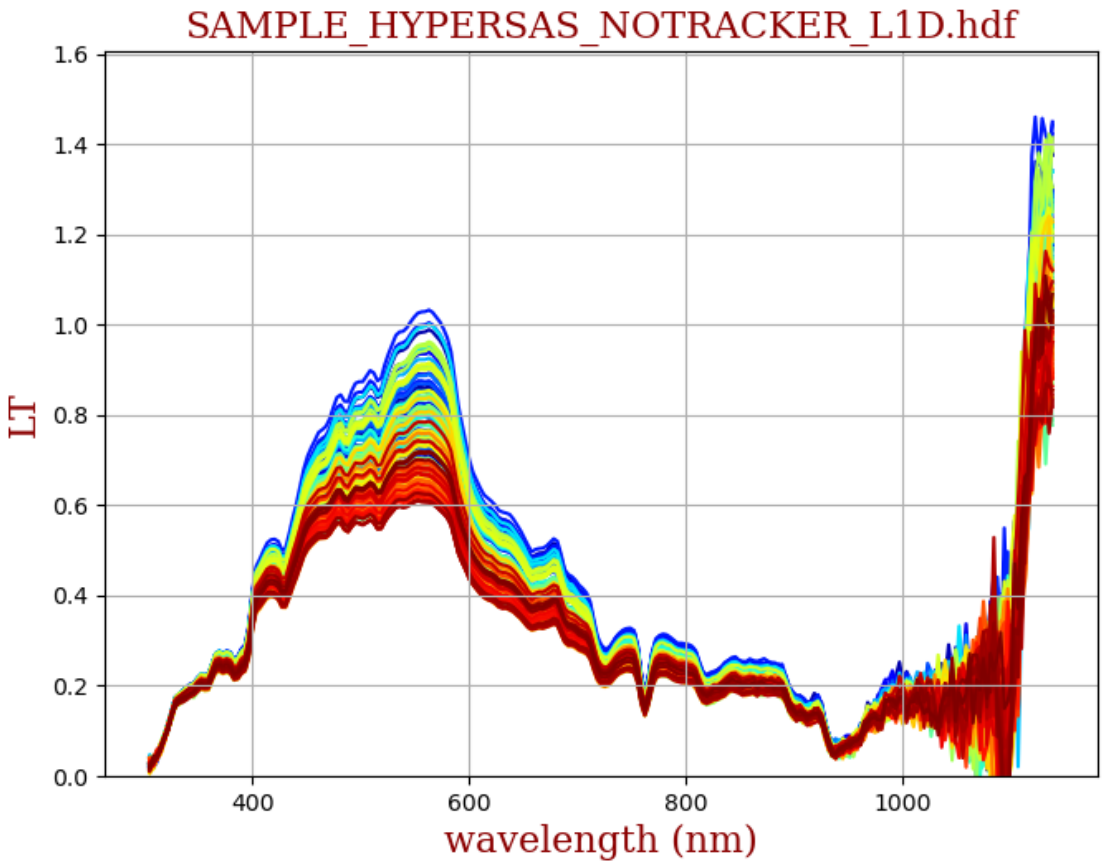
File: SAMPLE_HYPERSAS_NOTRACKER Collected: Sun Sep 08 13:30:27 2019



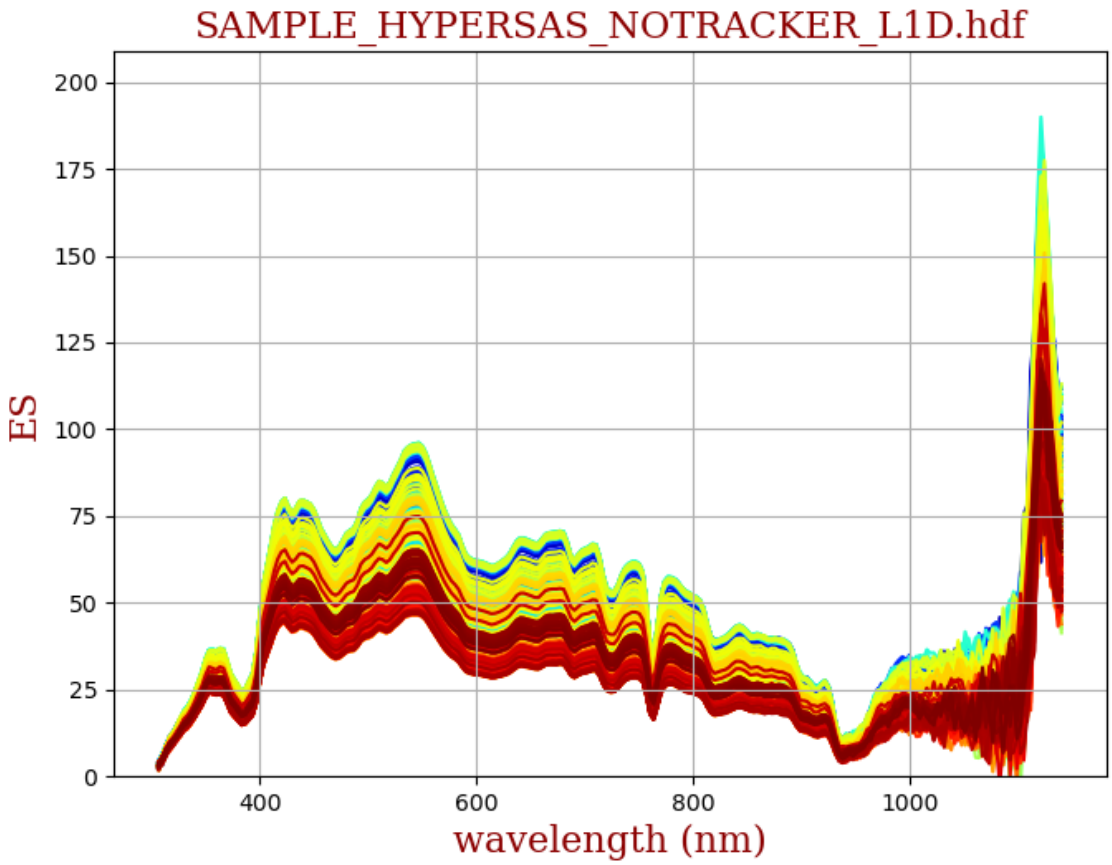


Complete spectral plots

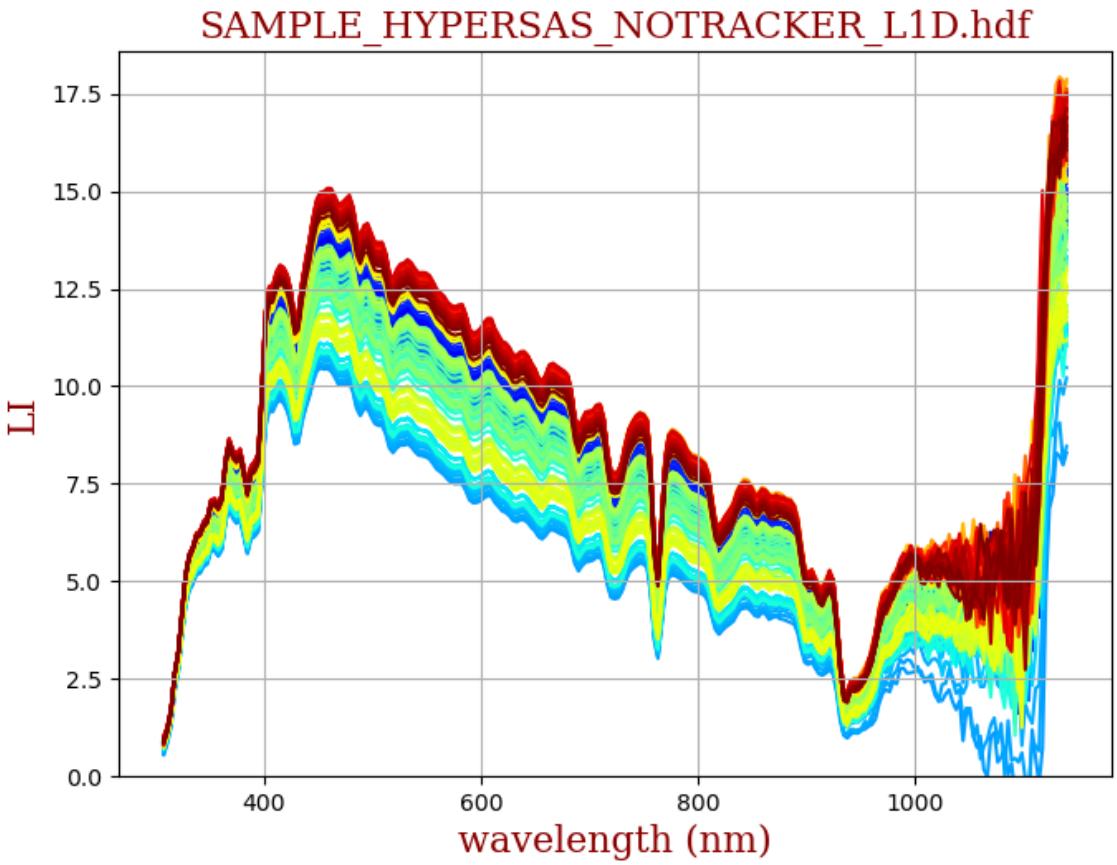
File: SAMPLE_HYPERSAS_NOTRACKER Collected: Sun Sep 08 13:30:27 2019



File: SAMPLE_HYPERSAS_NOTRACKER Collected: Sun Sep 08 13:30:27 2019



File: SAMPLE_HYPERSAS_NOTRACKER Collected: Sun Sep 08 13:30:27 2019



L2 : Process L1E to L2

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

Processing Parameters:
Max Wind: 10.0
Min SZA: 20.0
Max SZA: 70.0
Filter Sigma Es: 5.0
Filter Sigma Li: 3.0
Filter Sigma Lt: 2.0
Cloud Filter: 1.0
Es Filter: 2.0
Dawn/Dusk Filter: 1.0
Rain/Humidity Filter: 1.095
Ensemble Duration: 300 sec
Percent Lt Filter: 10.0
Glint_Correction: Mobley 1999
NIR Correction: Mueller and Austin 1995
Remove Negatives: ON

Process log:
Process Single Level
ProcessL2:
/Users/daurin/GitRepos/HyperInSPACE/Data/L1E/SAMPLE_HYPERSAS_NOTRACKER_L1E.hdf
Model data for Wind and AOD may be used to replace blank values. Reading in model data...
Ancillary file found locally: N201925113_MERRA2_1h.nc
Ancillary file found locally: N201925113_AER_MERRA2_1h.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
High Wind: 10
Passed. SZA: 55, Wind: 10
  Flag data from TT2: 2019-09-08 13:31:35.407000+00:00 to 2019-09-08 13:33:10.817000+00:00
Percentage of data out of SZA and Wind limits: 28 %
Remove IRRADIANCE Data
  Length of dataset prior to removal 126 long
  Length of dataset after removal 91 long: 28% removed
Remove RADIANCE Data
  Length of dataset prior to removal 126 long
  Length of dataset after removal 91 long: 28% removed
Remove ANCILLARY Data
  Length of dataset prior to removal 126 long
  Length of dataset after removal 91 long: 28% removed
Applying spectral filtering to eliminate noisy spectra.
1.1% of Es data flagged
5.5% of Li data flagged

24.2% of Lt data flagged
Remove IRRADIANCE Data
  Length of dataset prior to removal 91 long
  Length of dataset after removal 65 long: 29% removed
Remove RADIANCE Data
  Length of dataset prior to removal 91 long
  Length of dataset after removal 65 long: 29% removed
Remove ANCILLARY Data
  Length of dataset prior to removal 91 long
  Length of dataset after removal 65 long: 29% removed
Applying meteorological filtering to eliminate spectra.
Quality Check: ES(470.0)/ES(680.0) < dawnDuskFlag:1.0
Quality Check: ES(470.0)/ES(680.0) < dawnDuskFlag:1.0
Quality Check: ES(470.0)/ES(680.0) < dawnDuskFlag:1.0
Quality Check: ES(470.0)/ES(680.0) < dawnDuskFlag:1.0
Quality Check: ES(470.0)/ES(680.0) < dawnDuskFlag:1.0
Quality Check: ES(470.0)/ES(680.0) < dawnDuskFlag:1.0
Quality Check: ES(470.0)/ES(680.0) < dawnDuskFlag:1.0
Quality Check: ES(470.0)/ES(680.0) < dawnDuskFlag:1.0
Quality Check: ES(470.0)/ES(680.0) < dawnDuskFlag:1.0
Quality Check: ES(470.0)/ES(680.0) < dawnDuskFlag:1.0
Quality Check: ES(470.0)/ES(680.0) < dawnDuskFlag:1.0
Quality Check: ES(470.0)/ES(680.0) < dawnDuskFlag:1.0
Quality Check: ES(470.0)/ES(680.0) < dawnDuskFlag:1.0
Quality Check: ES(470.0)/ES(680.0) < dawnDuskFlag:1.0
Quality Check: ES(470.0)/ES(680.0) < dawnDuskFlag:1.0
Quality Check: ES(470.0)/ES(680.0) < dawnDuskFlag:1.0
Quality Check: ES(470.0)/ES(680.0) < dawnDuskFlag:1.0
Quality Check: ES(470.0)/ES(680.0) < dawnDuskFlag:1.0
Quality Check: ES(470.0)/ES(680.0) < dawnDuskFlag:1.0
Quality Check: ES(470.0)/ES(680.0) < dawnDuskFlag:1.0
Quality Check: ES(470.0)/ES(680.0) < dawnDuskFlag:1.0
Quality Check: ES(470.0)/ES(680.0) < dawnDuskFlag:1.0
Quality Check: ES(470.0)/ES(680.0) < dawnDuskFlag:1.0
Quality Check: ES(470.0)/ES(680.0) < dawnDuskFlag:1.0
Quality Check: ES(470.0)/ES(680.0) < dawnDuskFlag:1.0
Quality Check: ES(470.0)/ES(680.0) < dawnDuskFlag:1.0
Quality Check: ES(470.0)/ES(680.0) < dawnDuskFlag:1.0
Quality Check: ES(470.0)/ES(680.0) < dawnDuskFlag:1.0
Quality Check: ES(470.0)/ES(680.0) < dawnDuskFlag:1.0
Quality Check: ES(470.0)/ES(680.0) < dawnDuskFlag:1.0
46.2% of spectra flagged
Remove IRRADIANCE Data
  Length of dataset prior to removal 65 long
  Length of dataset after removal 35 long: 46% removed
Remove RADIANCE Data
  Length of dataset prior to removal 65 long
  Length of dataset after removal 35 long: 46% removed
Remove ANCILLARY Data

Length of dataset prior to removal 65 long
Length of dataset after removal 35 long: 46% removed
Binning datasets to ensemble time interval.
25 spectra in slice (ensemble).
2 spectra remaining in slice to average after filtering to lowest 10.0%.
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 avw
Processing CDOM, Sg, DOC
Processing qaa
Processing Wei QA
L2 file produced:
/Users/daurin/GitRepos/HyperInSPACE/Data/L2/SAMPLE_HYPERSAS_NOTRACKER_L2.hdf
Output SeaBASS for HDF:
/Users/daurin/GitRepos/HyperInSPACE/Data/L2/SAMPLE_HYPERSAS_NOTRACKER_L2.hdf