JPSS Validation System

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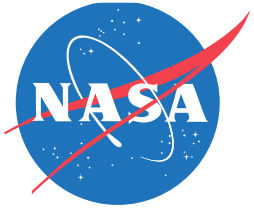


Outline

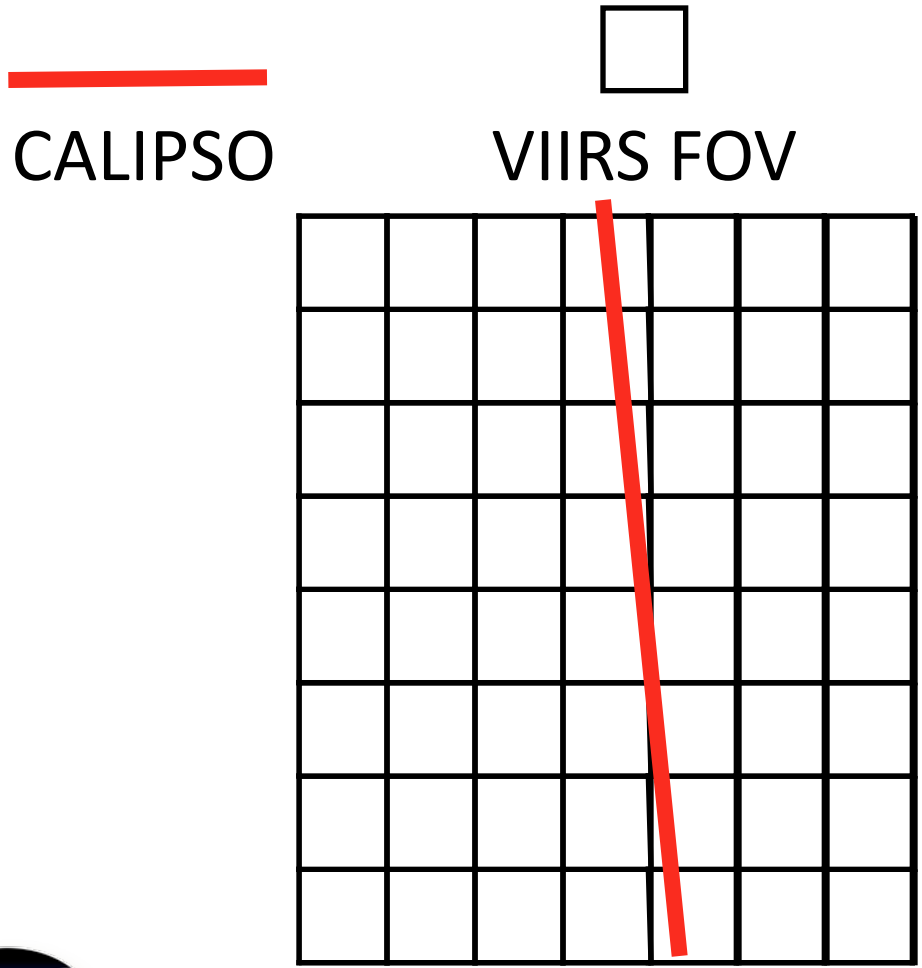
- An overview the processing and validation tools
- Products and data access (Atmospheric PEATE)
- Developing a near realtime monitoring system for cloud products

Ingested Products at UW SSEC

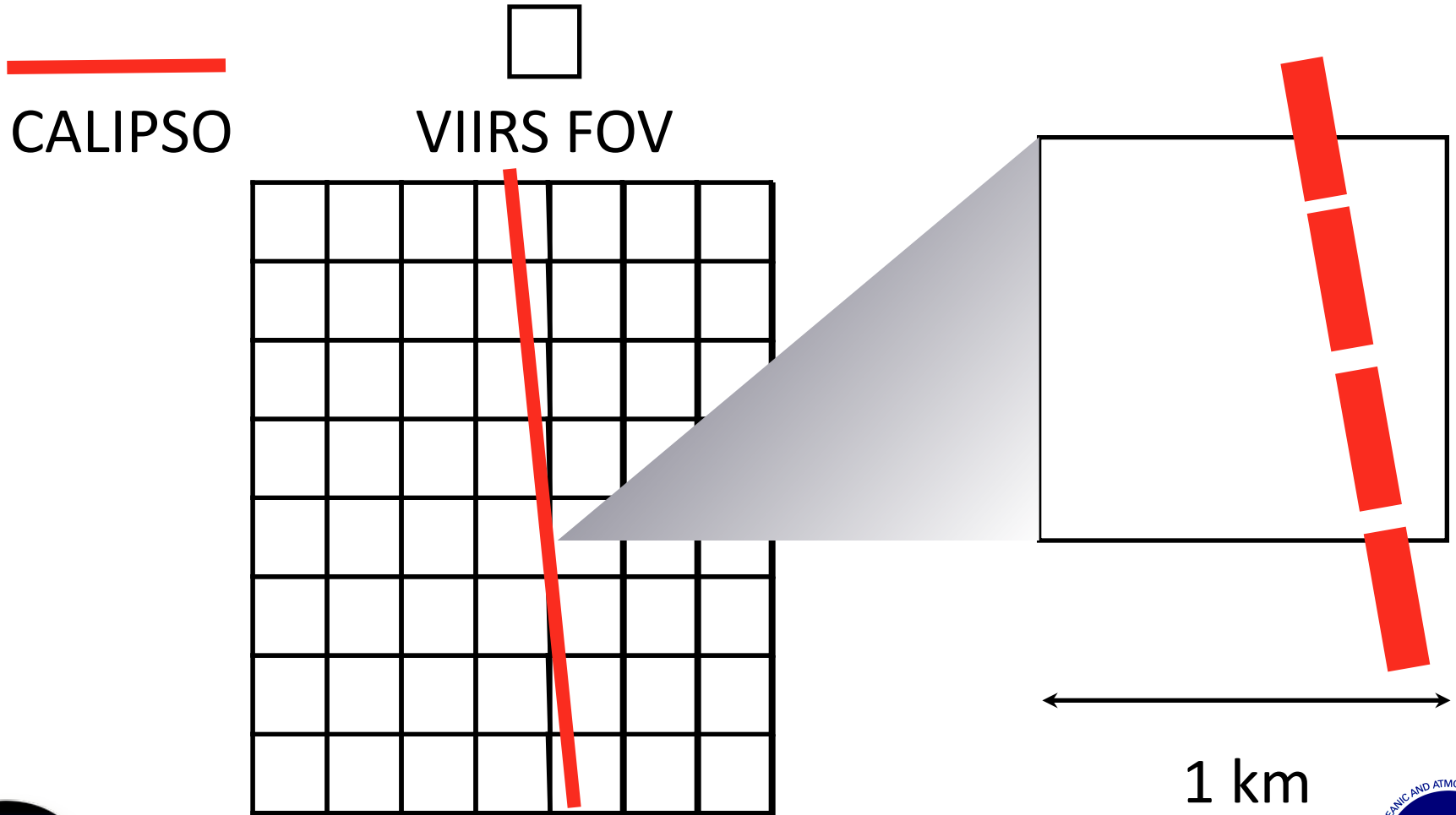
Ingested Products

- VIIRS RDR, SDR, and EDR (Clouds and Aerosols)
- MODIS Terra and Aqua L1a, L1b, MYD04 (aerosol), MYD06 (Cloud)
- AVHRR L1B
- ATMS RDR and SDR
- CALIPSO V3 L1b, L2 products (aerosol), and IIR
- CloudSat L1 and L2 products
- CrIS SDR and EDR
- Metop-A (IASI) and Metop-B (IASI)

Collocation and Evaluation



Collocation and Evaluation



Collocation and Evaluation

PEATE multi-satellite sensors collocation

Master \ Follower	AVHRR	CALIOP	CLOUDSAT	GOES	MODIS	POLDER	SEVIRI	VIIRS
AIRS		✸	✸	✸	✸		✸	
AMSR-E					✸			
CLOUDSAT		✸						✸
CrIS		✸					✸	✸
COMS		✸			✸			
GOES		✸			✸			
HIRS	✸	✸						
IASI					✸		✸	
MODIS		✸				✸		✸
SEVIRI		✸			✸			✸
VIIRS		✸						

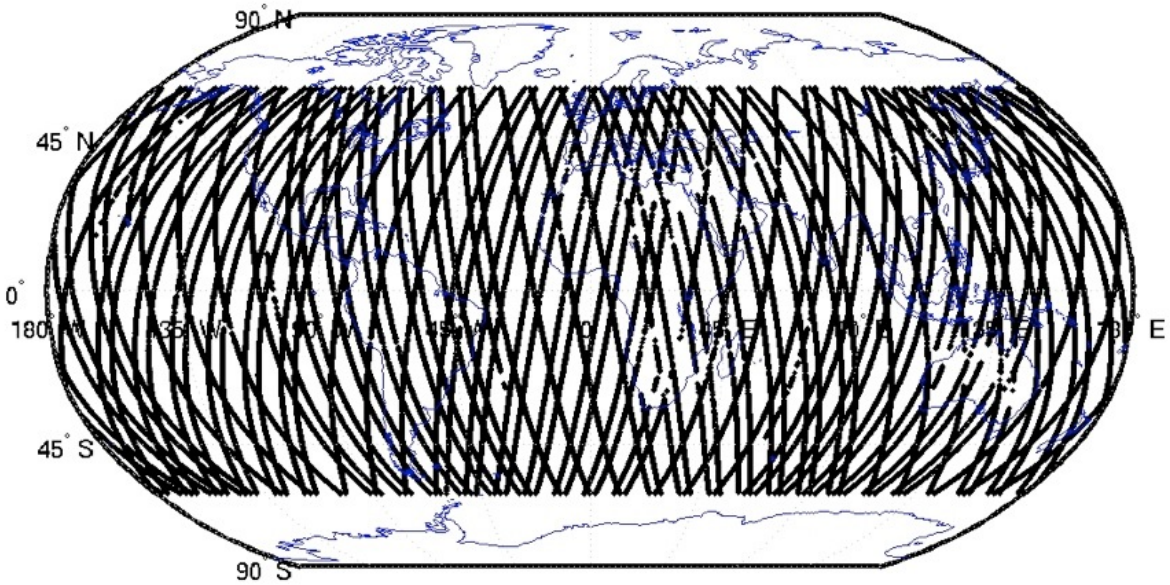
The Flo Processing System

- Leverages UW Atmospheric PEATE processing system
- Supports forward stream and archival processing
- Geographical and multi-sensor processing via integrated orbital prediction
- An extensible catalog of scientific algorithms; algorithms specify sensor and ancillary input requirements; Flo chains algorithms together as needed to reach output products
- Provides the capability to processes the collocation and algorithms that require multiple instruments platforms (ie VIIRS and CrIS)

Collocation and Evaluation

Aqua/CALIPSO Intersections with NPP

May 1 - Aug 11 2012Observations within 20 min



Collocation and Evaluation

Match Files Generation

```
CALIPSO_Feature_Classification_Flag_Phase_Fraction_5km: [2704x3 double]
      CALIPSO_Feature_Classification_Flag_Phase_QA_5km: [2704x1 double]
                  CALIPSO_IR_Derived_Cloud_Height_5km: [2704x1 double]
                    Column_Optical_Depth_Aerosols_532: [2704x1 double]
         Column_Optical_Depth_Aerosols_Uncertainty_532: [2704x1 double]
                                     CALIPSO_Pressure: [33x2704 double]
                                Master_Vertical_Index: [2704x1 double]
                              Master_Horizontal_Index: [2704x1 double]
                                         Slave_Index: [2704x3 double]
                                       Parallax_Table: [677x32 double]
                                   CALIOP_GDAS_Pressure: [2704x33 double]
                                   CALIOP_GDAS_Altitude: [33x1 double]
           IFF_L1b_BrightnessTemperatureBandCenters: [11x1 double]
                 IFF_L1b_BrightnessTemperatureBands: [2704x11 double]
                        IFF_L1b_EmissiveBandCenters: [11x1 double]
                           IFF_L1b_EmissiveBands: [2704x11 double]
                             IFF_L1b_LandSeaMask: [2704x1 double]
                                IFF_L1b_Latitude: [2704x1 double]
                               IFF_L1b_Longitude: [2704x1 double]
                      IFF_L1b_ReflectiveBandCenters: [11x1 double]
                       IFF_L1b_ReflectiveSolarBands: [2704x11 double]
                                 IFF_CLX_Cloud_Mask: [2704x1 double]
                              IFF_CLX_surface_type: [2704x1 double]
                               IFF_CLX_cloud_phase: [2704x1 double]
                            IFF_CLX_cld_press_acha: [2704x1 double]
                             IFF_CLX_cld_temp_acha: [2704x1 double]
                           IFF_CLX_cld_height_acha: [2704x1 double]
                        IFF_CLX_cld_height_top_acha: [2704x1 double]
                       IFF_CLX_cld_height_base_acha: [2704x1 double]
```

Collocation and Evaluation

Current available multi-satellite sensors

	Geo-stationary satellites sensors		Polar-orbiting satellites sensors		
	SEVIRI	***COMS***	***VIIRS***	***CALIOP***	***MODIS (Aqua)***
MODIS (Aqua)	✔✔	✔✔	✔✔	✔✔	
VIIRS				✔	✔✔
CALIOP	✔	✔✔	✔		✔✔

✔ Aerosol Products

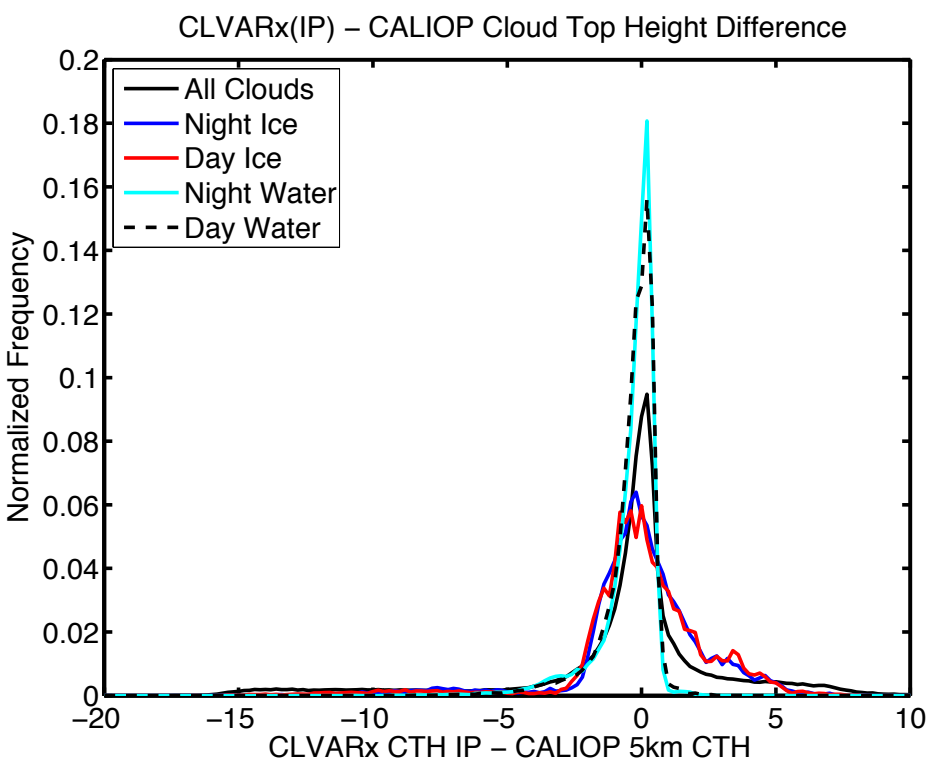
✔ Cloud Products

SSEC

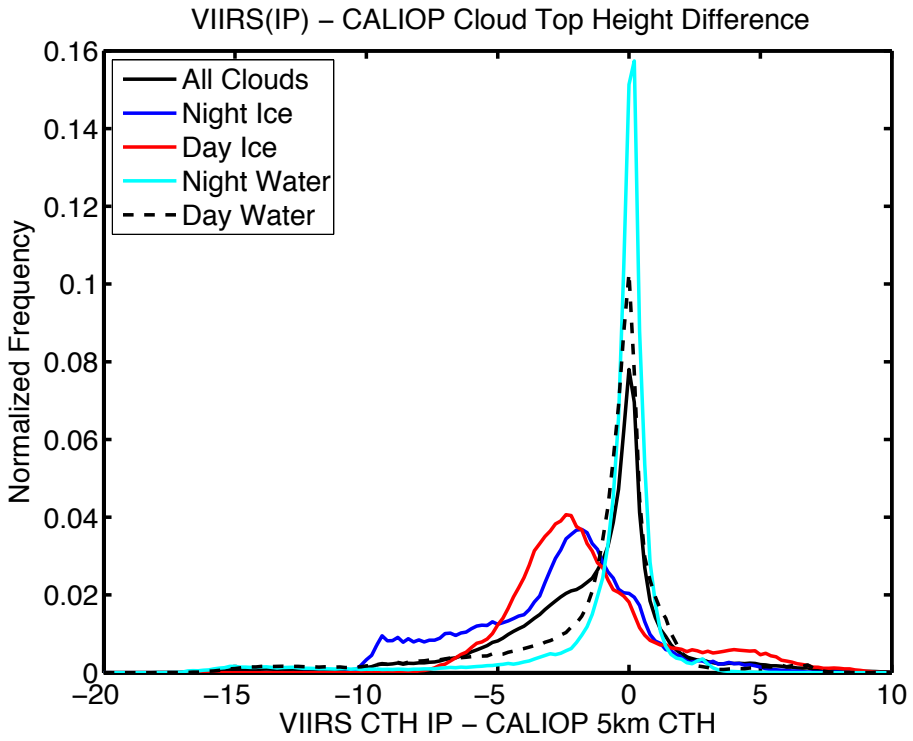
NOAA NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION U.S. DEPARTMENT OF COMMERCE

Cloud Height Validation

NDE Applied to VIIRS



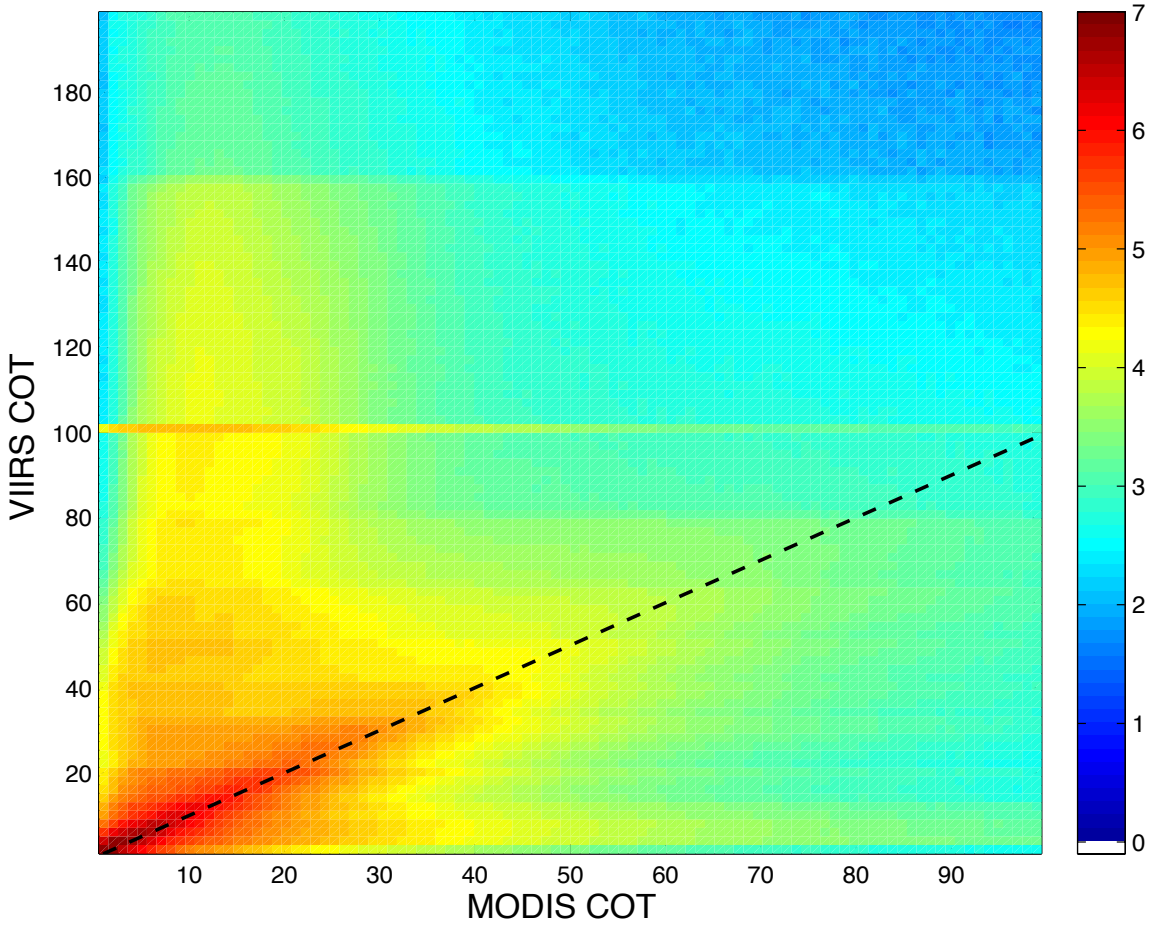
IDPS IP



	COT < 1.0	COT >1.0
Accuracy (mean km) % in spec	12 %	63 %
Precision (STD) (km) % in spec	43 %	49 %

- 3 Months of data
- IDPS has significant low bias

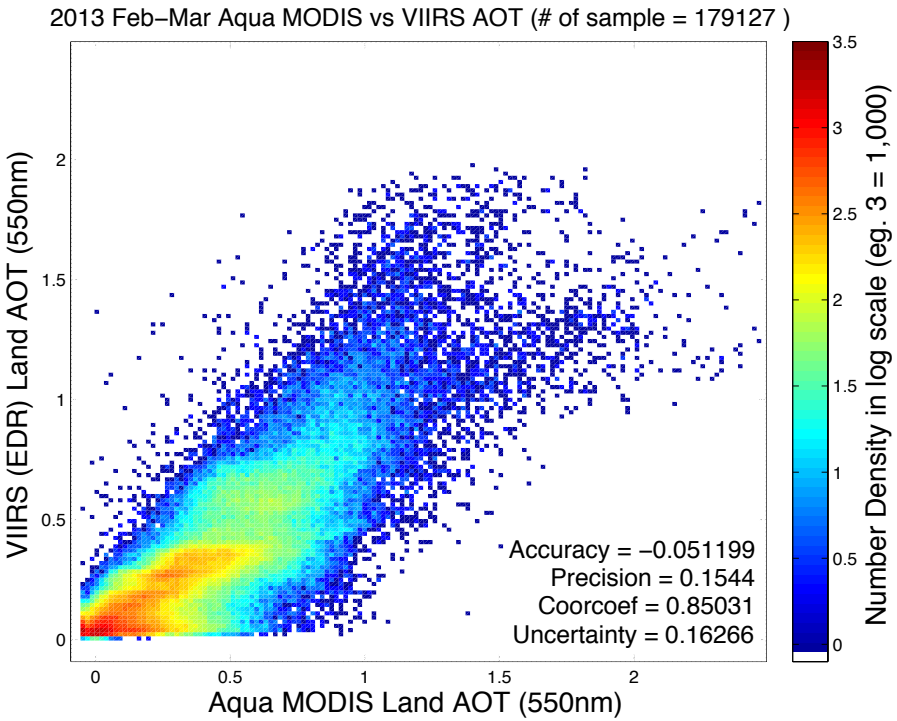
Cloud Cloud Optical Thickness



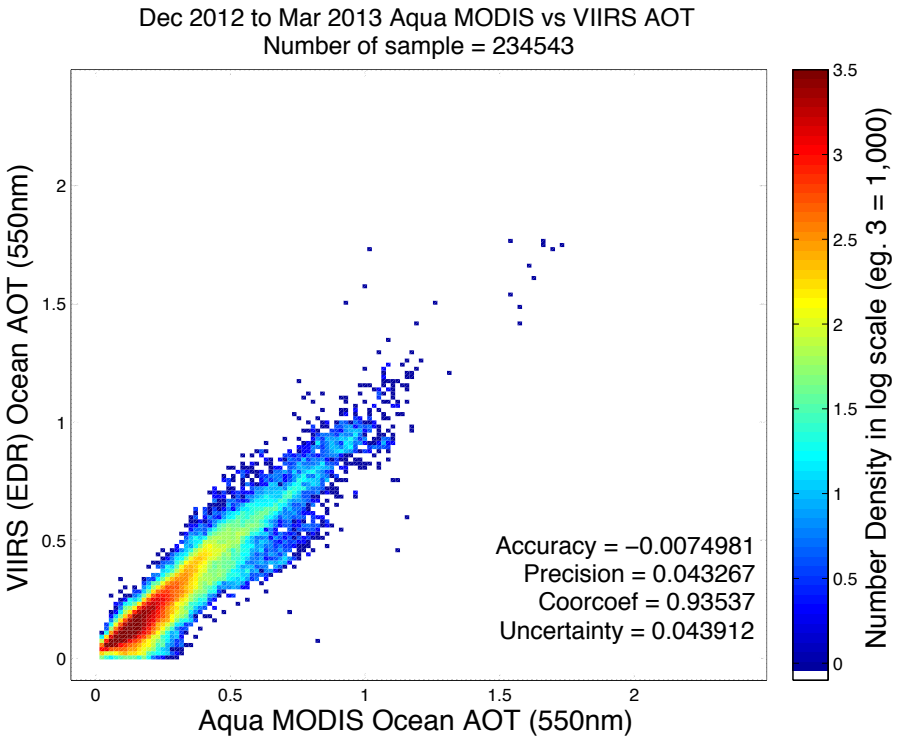
- Number of sample= 234 mills
- Both Ice and water cloud
- Color bar shows number density in log scale (example: 3 =1,000)

Aerosol AOD Validation Against MODIS

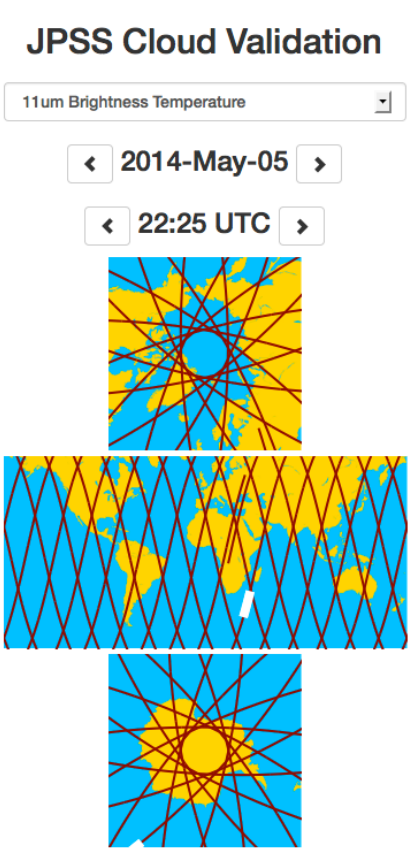
IDPS EDR Land

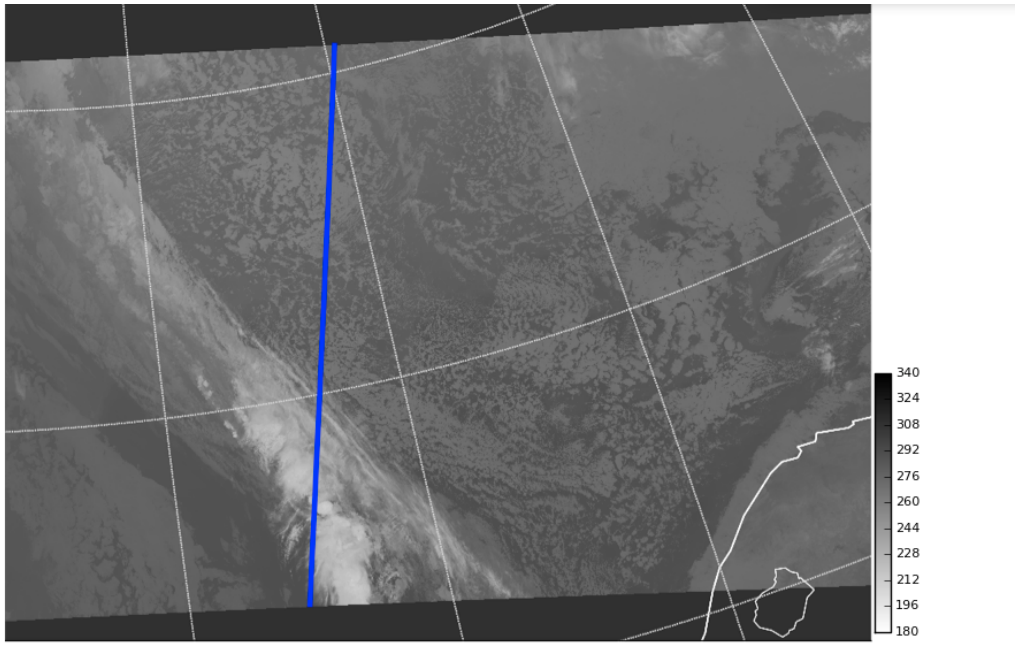


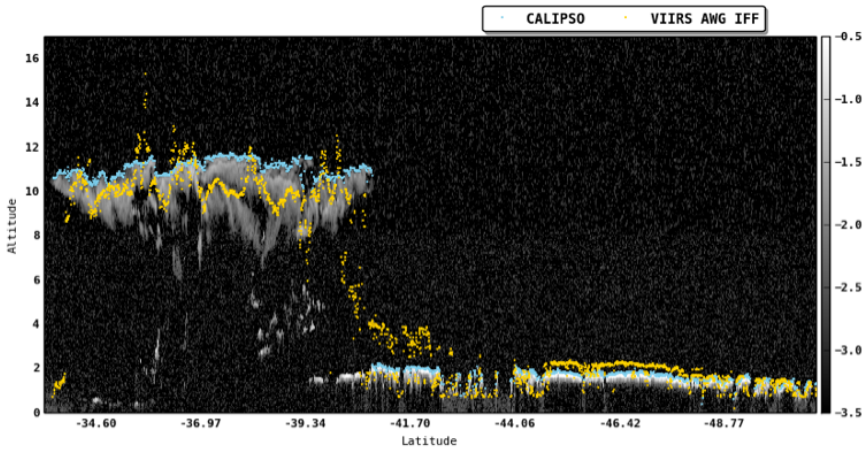
IDPS EDR Ocean



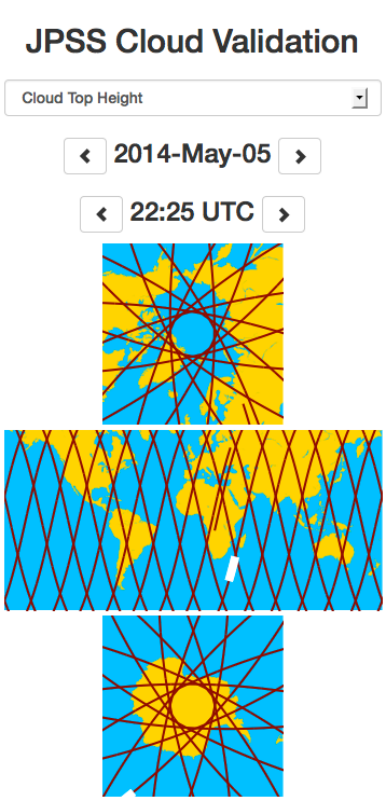
JPSS Cloud Validation Interface

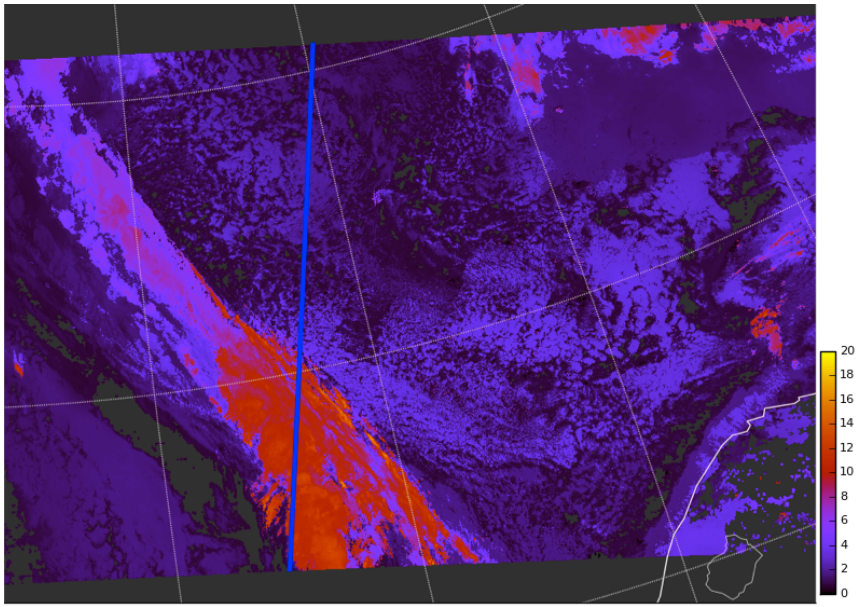


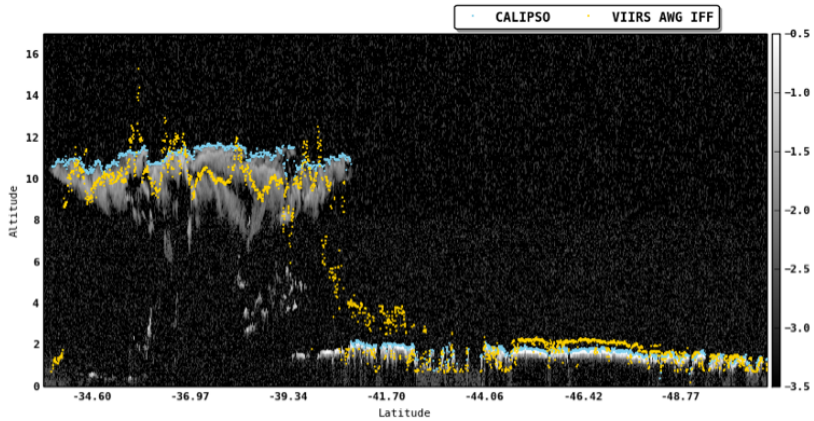




JPSS Cloud Validation Interface







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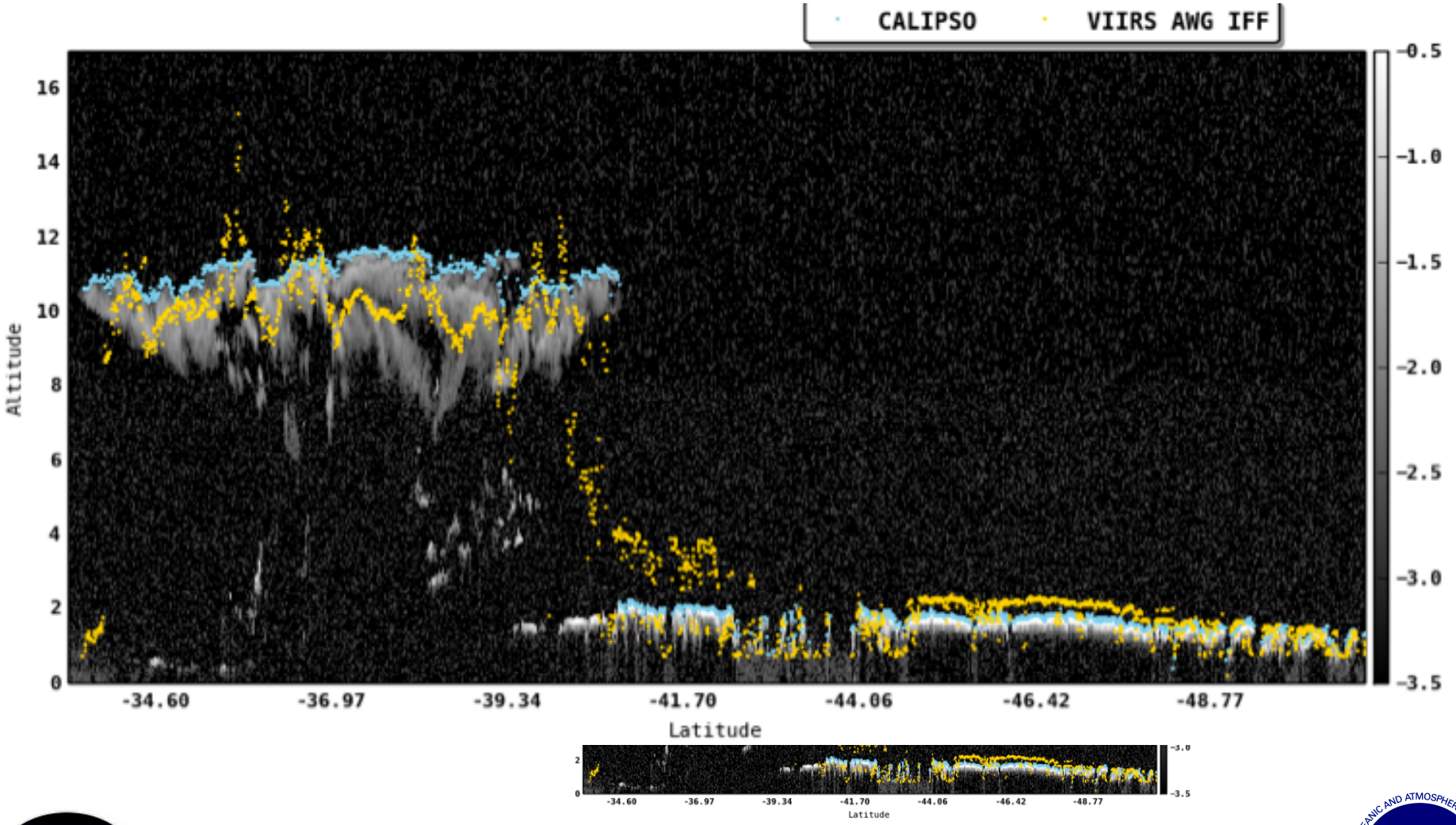

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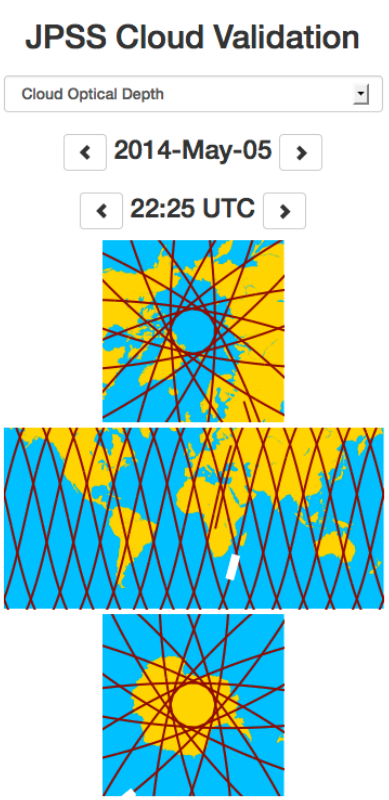
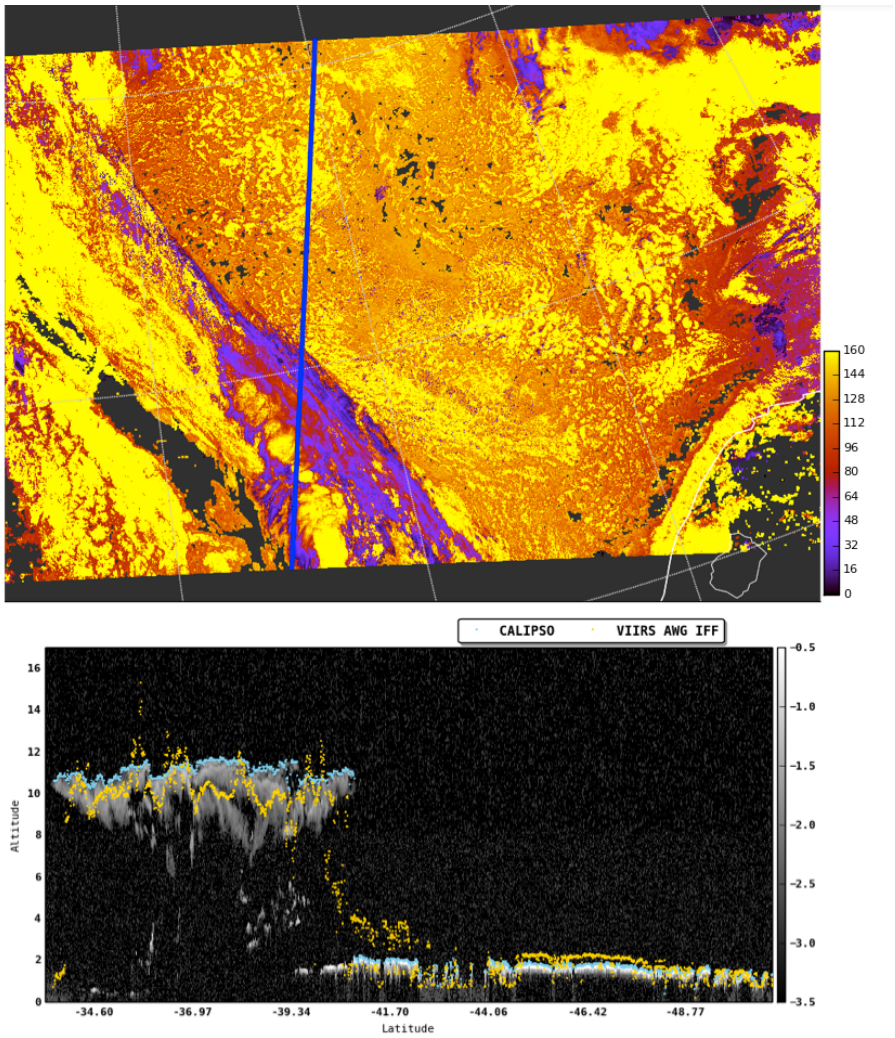


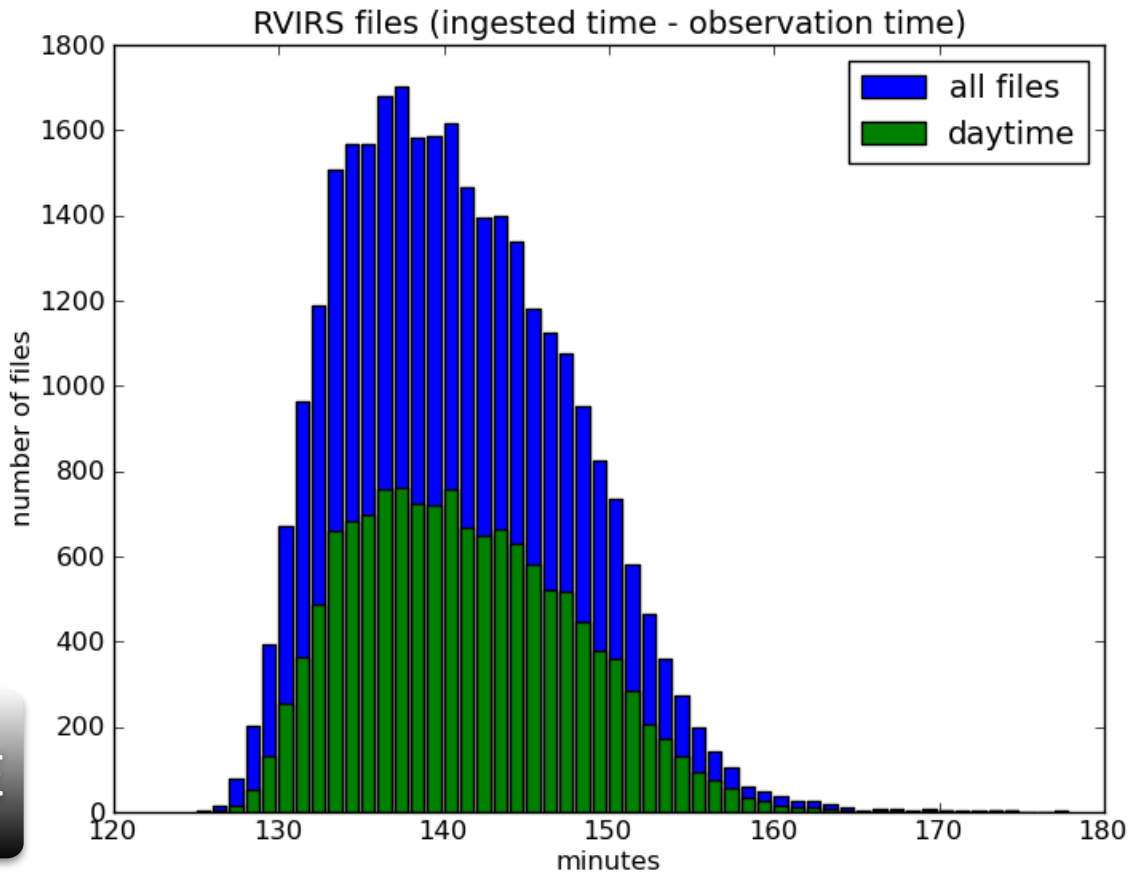


Near Real Time Processing

- 97% of VIIRS RDR files are created at 118 minutes after observation
- PEATE could ingest VIIRS RDR files within 5 minutes after creation on the IDPS
- Process RDR - IP or EDR within 10 min after being ingested

VIIRS RDR 130 minutes (min)

VIIRS RDR Latency Between IDPS and PEATE



Take away messages

- UW SSEC is actively supporting the JPSS cloud and aerosol validation
- Leveraging our processing and collocation expertise has allowed long term inter-comparisons of the JPSS products to active (CALIOP) and passive (MODIS) observations
- We are currently developing a near realtime validation interface which will provide monitoring the of the JPSS products
- The system will also have the capability to reprocess selected products (NDE Clouds and ADL Aerosols) for evaluating algorithm changes