



BRAVO

Progress Meeting WP2

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29 November 2024

Koninklijk Meteorologisch Instituut België

**Institut Royal Météorologique
Belgique**

**Königliches Meteorologisches
Institut Belgien**

**Royal Meteorological
Institute of Belgium**

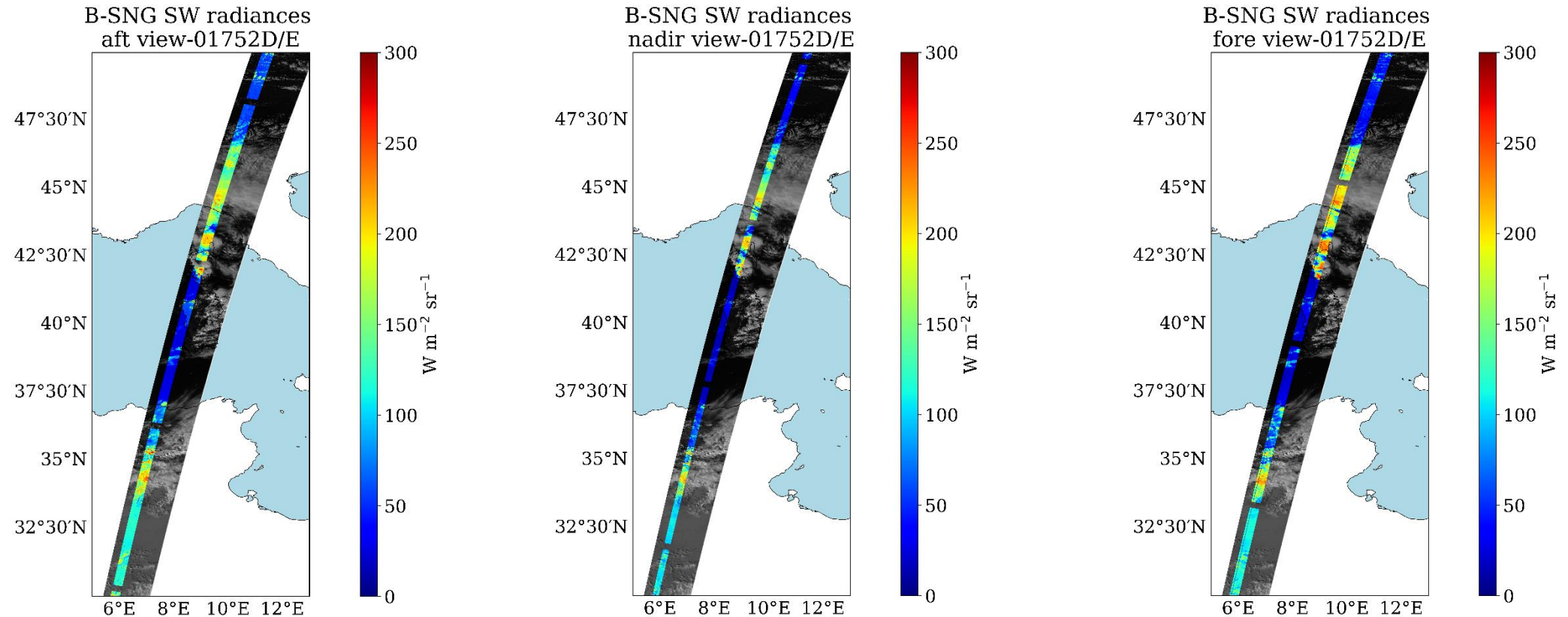
Overview WP2

Work Package number:	WP2
Work Package Title:	Commissioning phase
Responsible entity:	RMIB
WP responsible person	Aebi
Project phases (0,A,B,C,D,E):	E1
Beginning and end dates of WP	01.09.2024 – 30.11.2024
Total FTE allocated to the WP	3 PM (0.25 FTE)
Objectives of the WP: perform first, mostly qualitative, assessment of the BBR products at level 1	
Inputs: - Tools from WP1. - Commissioning L1b data for B-NOM, B-SNG and M-NOM Description of work and schedule: - Visualization of actual BBR products over several orbits, with context given by the MSI (color composite) - Statistical analysis of data from several orbits to highlight outliers, effect of observational conditions and differences between telescopes and pixels. - Analysis/visualisation of ratio between BBR and MSI-based BBR-like data. - Additional studies to address extreme and challenging conditions e.g. sun glint, high contrast changes during or close to the acquisition period. Excluded tasks: - The geolocation / coregistration assessment is excluded of this proposal as it is part of CARDINAL. - Tasks performed entirely by partners are not mentioned in this WP sheets. Deliverables and dates: - BBR L1 qualitative assessment report (30.11.2024). Risks: availability of the BBR L1b data.	

2.1
2.2
2.3
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Visualisation of actual BBR products over several orbits, with context given by the MSI (colour composite)

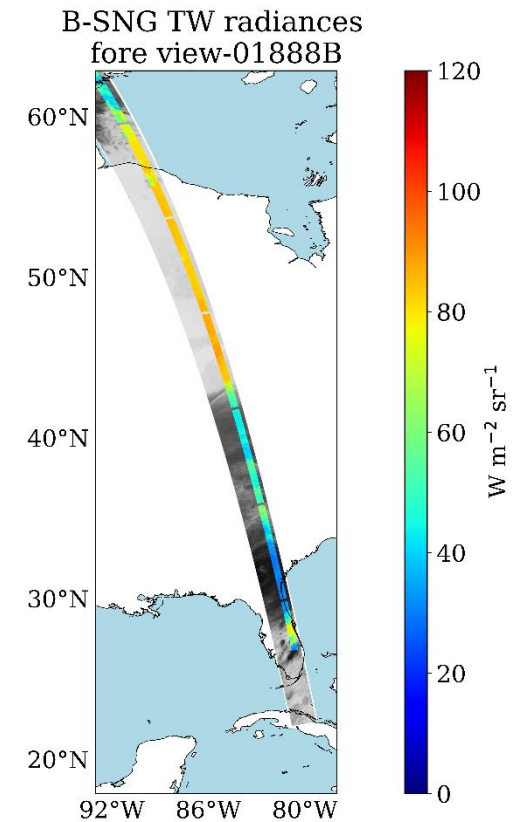
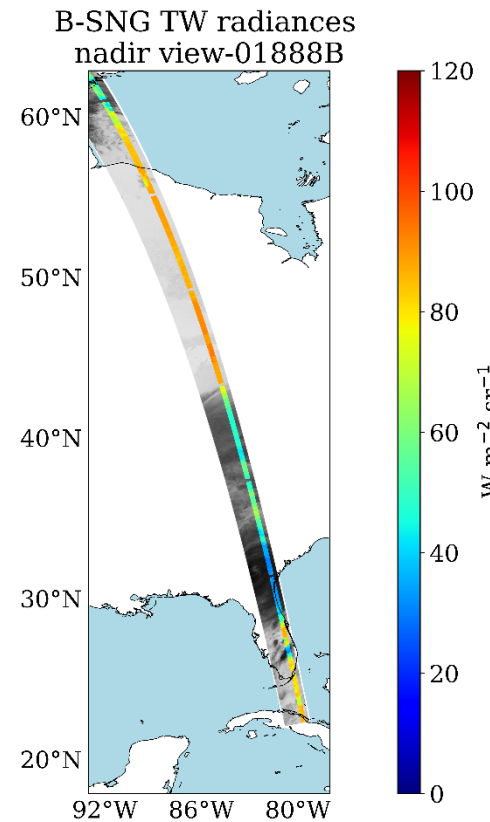
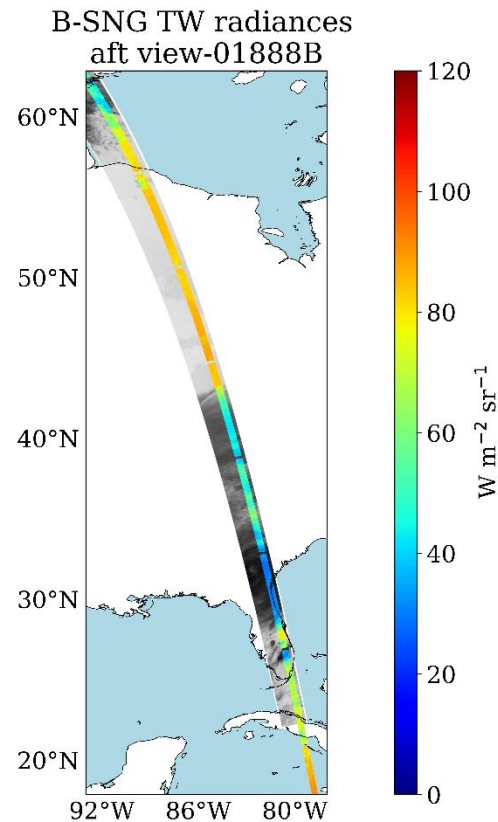
18/09/2024



WP2.1: Visualisation of actual BBR products

Visualisation of actual BBR products over several orbits, with context given by the MSI (colour composite)

27/09/2024



Statistical analysis of data from several orbits to highlight outliers, effect of observational conditions and differences between telescopes and pixels

- Part of this has already been shown at the first progress meeting in September.
- Python scripts have been improved and extended.
- Focusing on B-NOM product, baseline AC.
- Data availability: 27/07/2024 – 24/11/2024.

Statistical analysis of data from several orbits to highlight outliers, effect of observational conditions and differences between telescopes and pixels

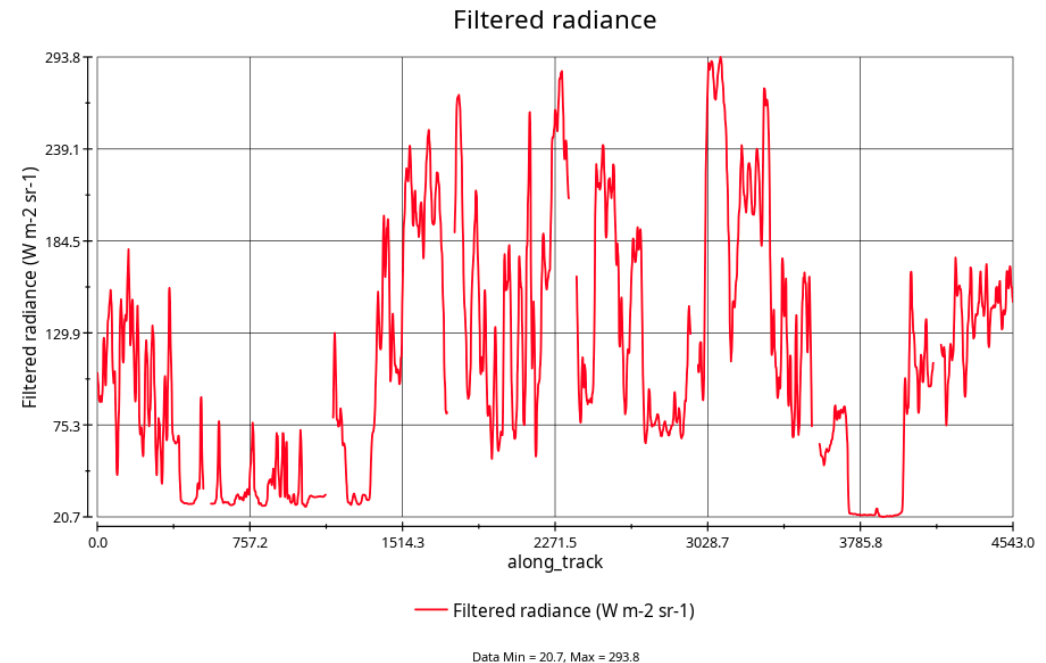
- Number of frames removed for the analyses (due to very high/low (negative) SW or LW radiance values):
 - August 2024: 3 frames
 - September 2024: 8 frames
 - October 2024: 12 frames
 - November 2024: 11 frames

WP2.2: Statistical Analysis of Data from Several Orbits

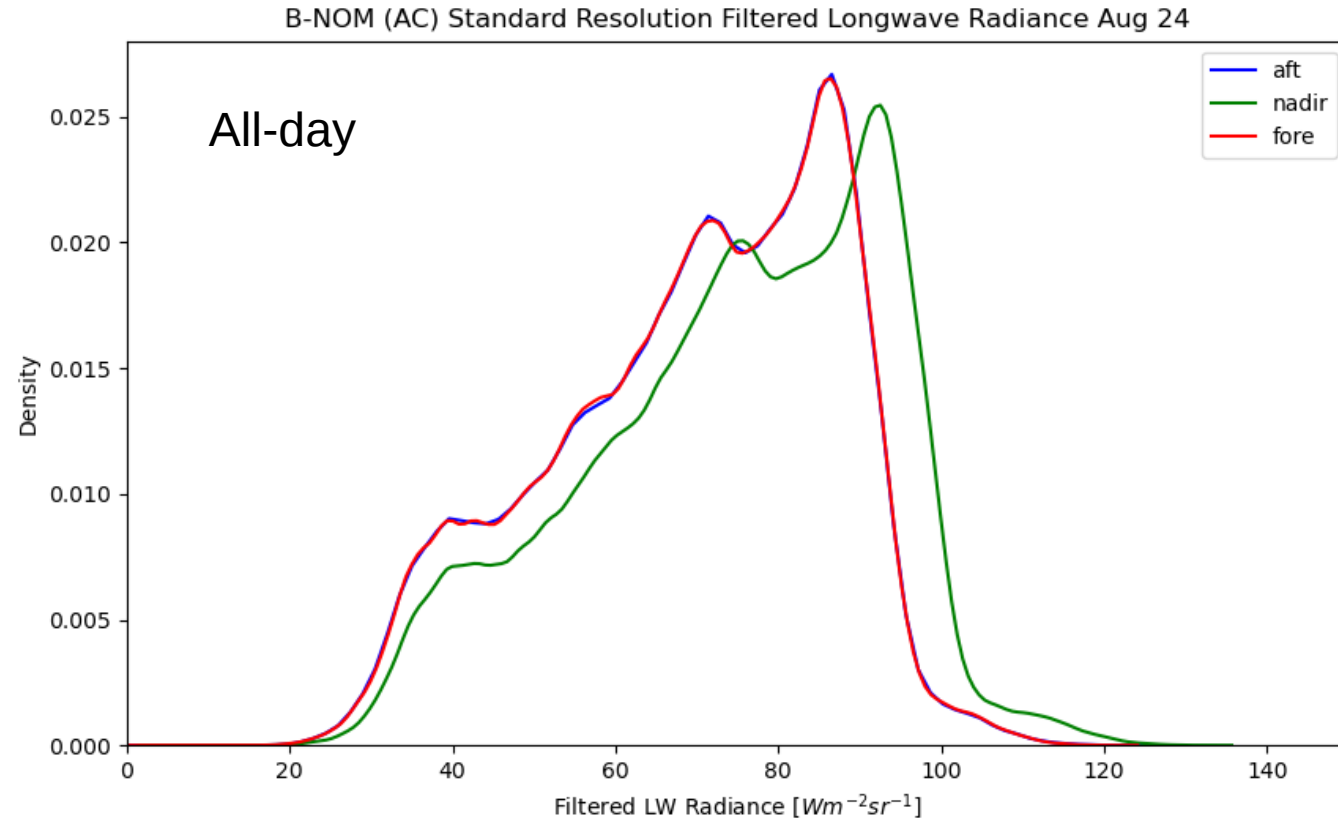
Statistical analysis of data from several orbits to highlight outliers, effect of observational conditions and differences between telescopes and pixels

- Number of frames removed for the analyses (due to very high/low (negative) SW or LW radiance values):
 - August 2024: 3 frames
 - September 2024: 8 frames
 - October 2024: 12 frames
 - November 2024: 11 frames

27/10/2024: Frame 02362E



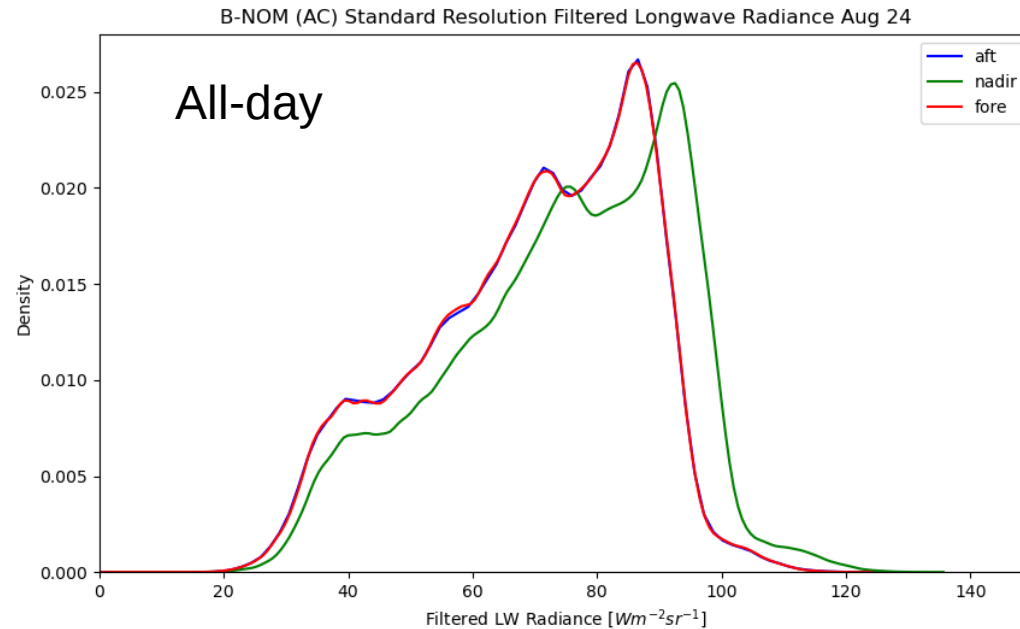
WP2.2: Distribution B-NOM LW Radiance, August 2024



View	Mean [$\text{Wm}^{-2}\text{sr}^{-1}$]	Std [$\text{Wm}^{-2}\text{sr}^{-1}$]	Median [$\text{Wm}^{-2}\text{sr}^{-1}$]
Aft	69.41	17.42	71.85
Nadir	74.45	18.43	76.75
Fore	69.40	17.40	71.82

WP2.2: Distribution B-NOM LW Radiance, Aug - Nov 2024

All values in $\text{Wm}^{-2}\text{sr}^{-1}$



Sep 2024:

N = 11 472 264

View	Mean	Std	Median
Aft	68.61	17.13	70.08
Nadir	73.48	18.34	74.94
Fore	68.64	17.10	70.09

Oct 2024:

N = 12 555 278

View	Mean	Std	Median
Aft	67.73	16.00	67.42
Nadir	72.53	17.20	72.31
Fore	67.80	15.96	67.46

Aug 2024:

N = 12 755 456

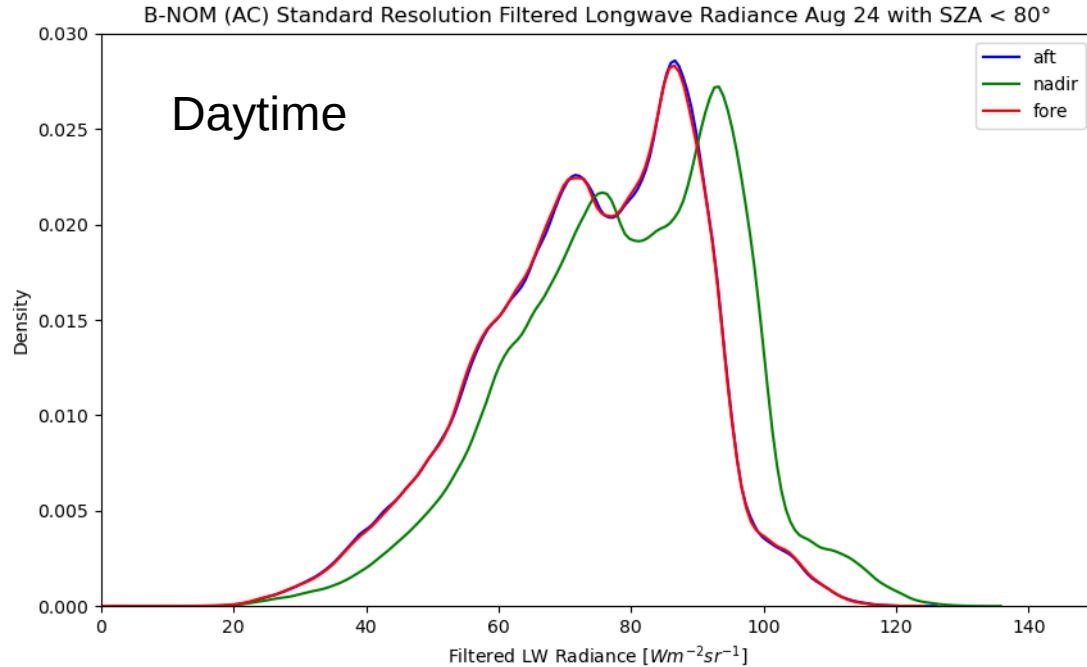
View	Mean	Std	Median
Aft	69.41	17.42	71.85
Nadir	74.45	18.43	76.75
Fore	69.40	17.40	71.82

Nov 2024:

N = 9 840 925

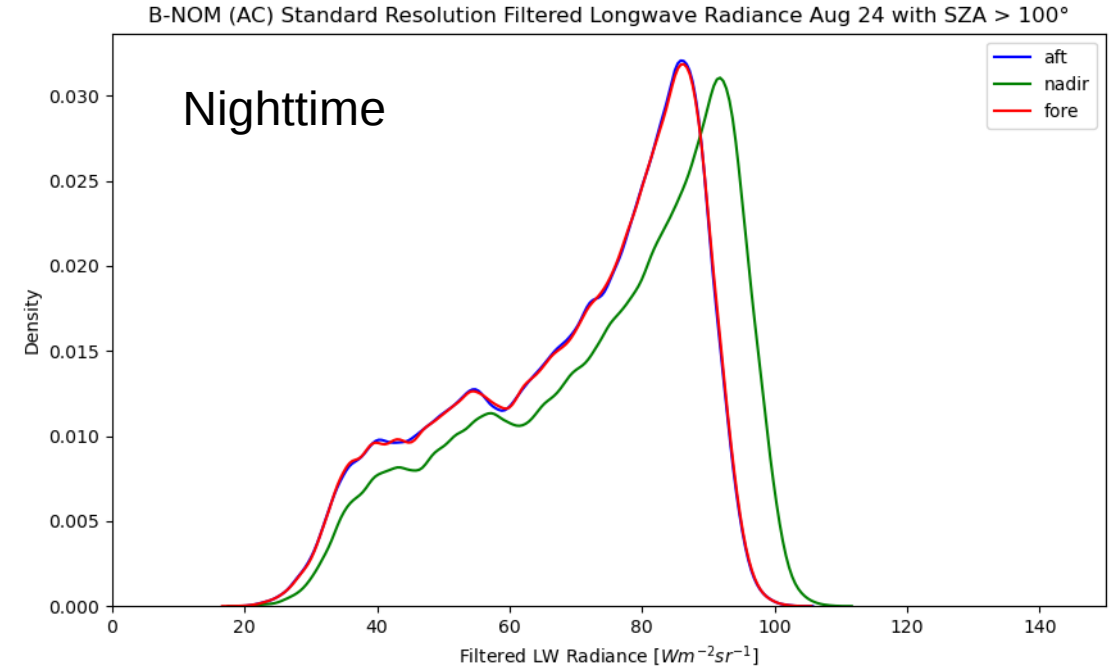
View	Mean	Std	Median
Aft	67.40	15.50	66.38
Nadir	72.07	16.61	71.12
Fore	67.40	15.47	66.35

WP2.2: Distribution B-NOM LW Radiance, August 2024



View	Mean	Std	Median
Aft	73.59	15.93	75.13
Nadir	79.31	16.63	80.55
Fore	73.54	15.92	75.07

N = 5'616'186

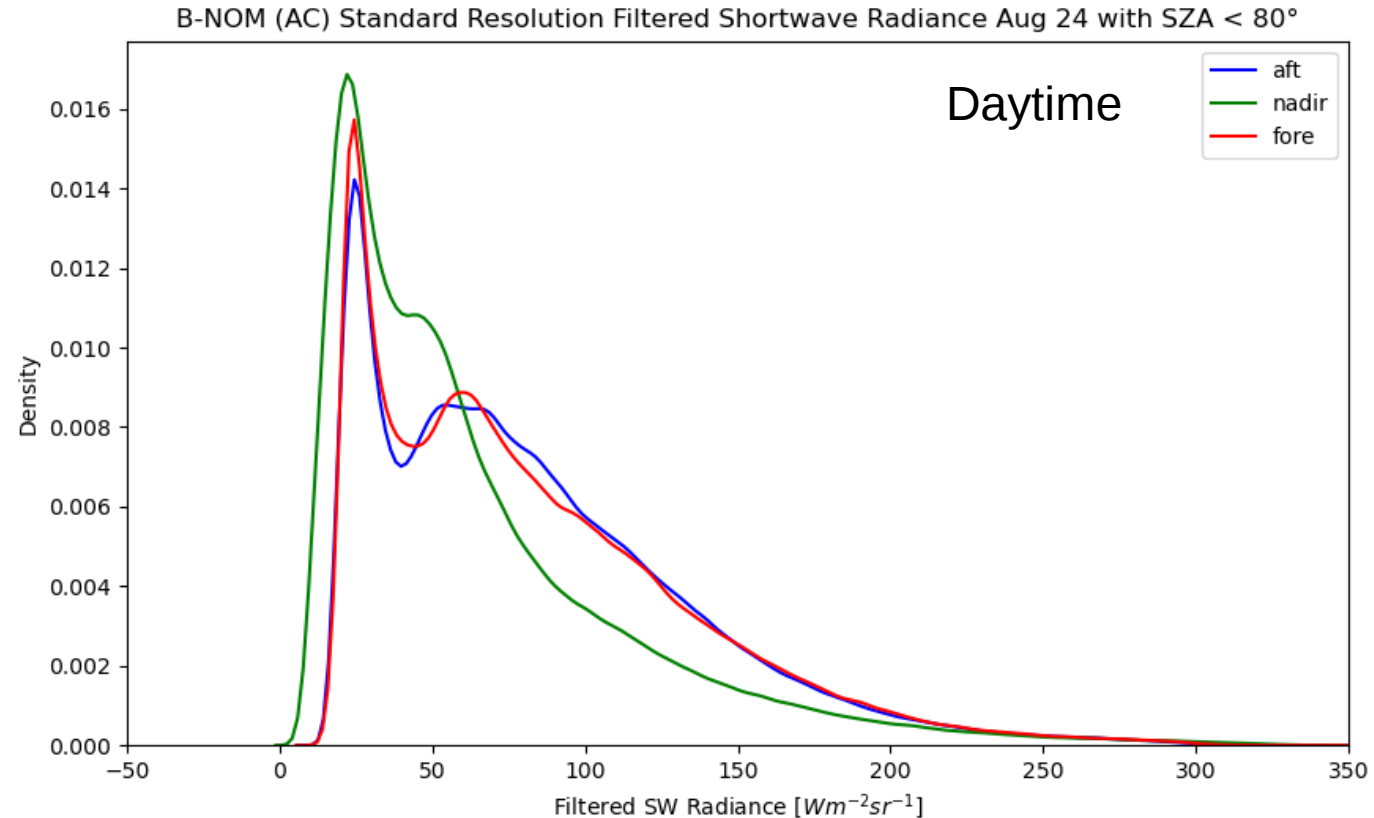


View	Mean	Std	Median
Aft	69.24	17.44	73.33
Nadir	74.17	18.25	78.61
Fore	69.27	17.45	73.40

N = 5'585'059

All values in $\text{Wm}^{-2}\text{sr}^{-1}$

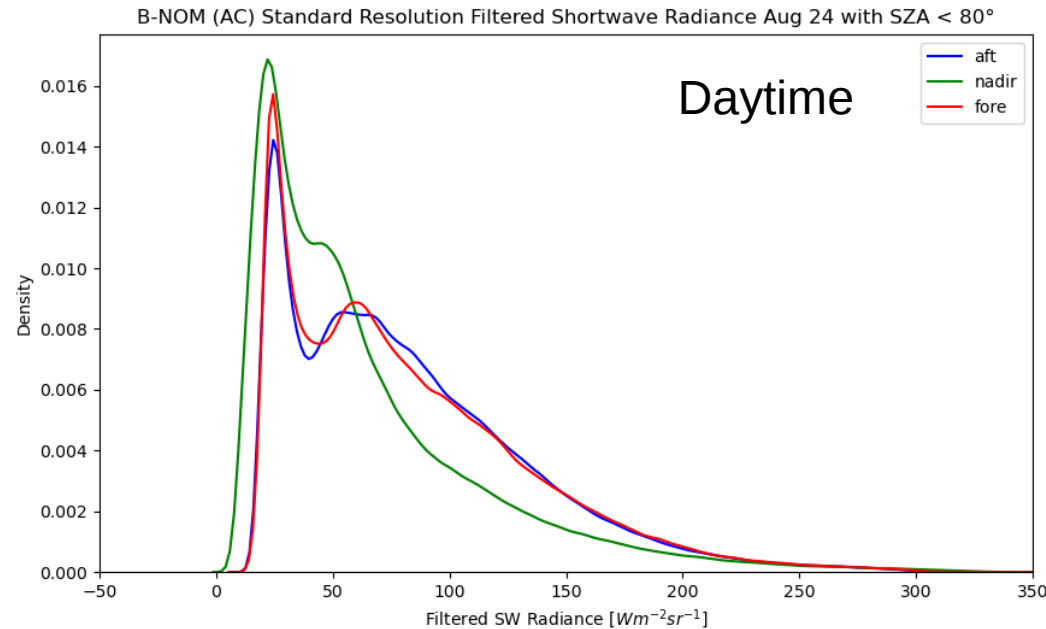
WP2.2: Distribution B-NOM SW Radiance, August 2024



View	Mean [$\text{Wm}^{-2}\text{sr}^{-1}$]	Std [$\text{Wm}^{-2}\text{sr}^{-1}$]	Median [$\text{Wm}^{-2}\text{sr}^{-1}$]
Aft	82.74	50.54	72.83
Nadir	64.69	50.34	49.73
Fore	82.27	51.37	71.09

WP2.2: Distribution B-NOM SW Radiance, Aug - Nov 2024

All values in $Wm^{-2}sr^{-1}$



Sep 2024:

N = 4 948 578

View	Mean	Std	Median
Aft	85.64	51.77	76.08
Nadir	67.38	49.93	54.84
Fore	83.76	51.62	74.85

Oct 2024:

N = 5 470 281

View	Mean	Std	Median
Aft	93.58	56.67	82.71
Nadir	76.57	54.73	63.05
Fore	91.69	55.97	82.89

Aug 2024:

N = 5 616 186

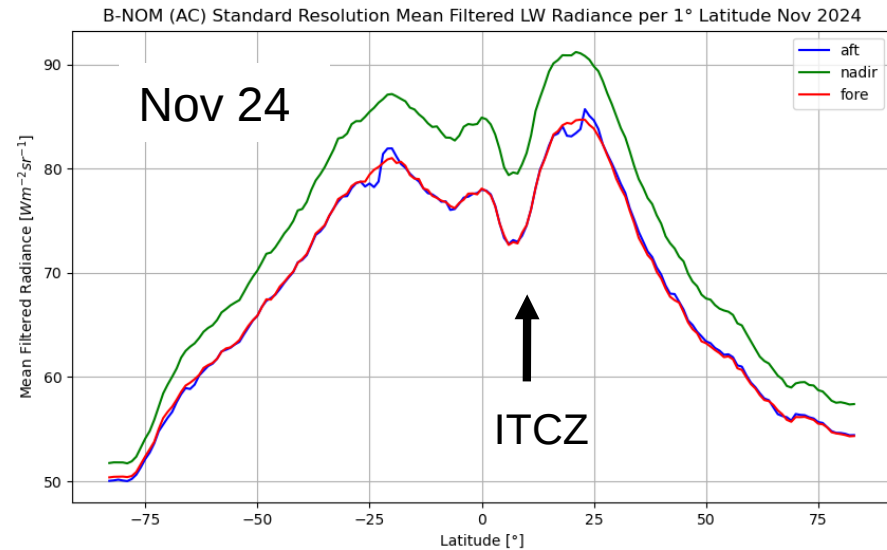
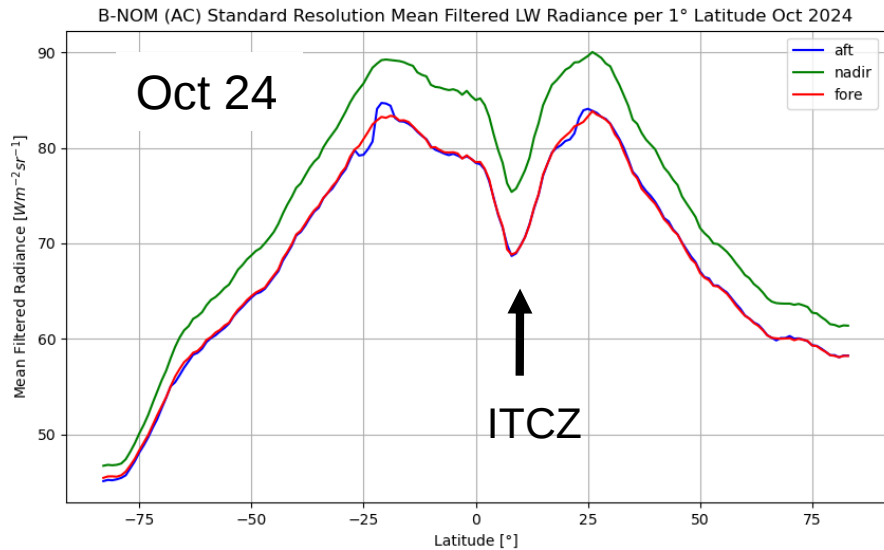
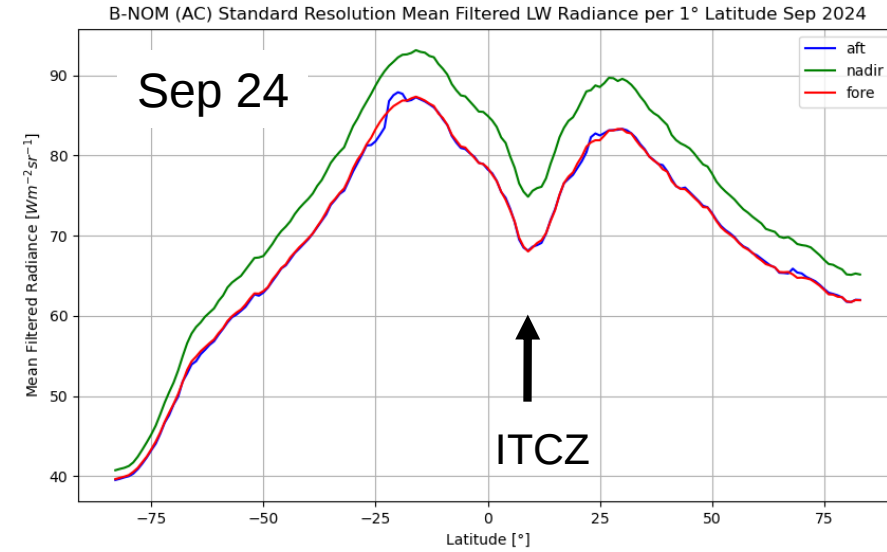
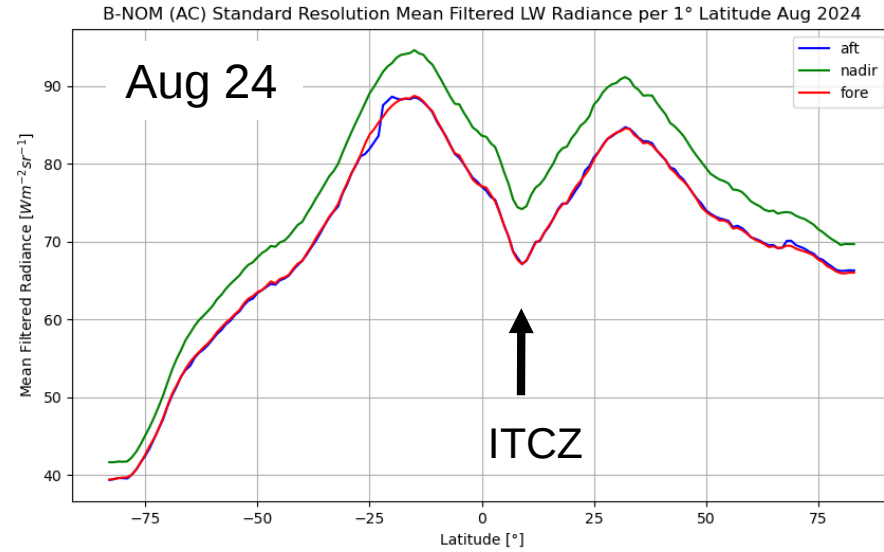
View	Mean	Std	Median
Aft	82.74	50.54	72.83
Nadir	64.69	50.34	49.73
Fore	82.27	51.37	71.09

Nov 2024:

N = 4 346 949

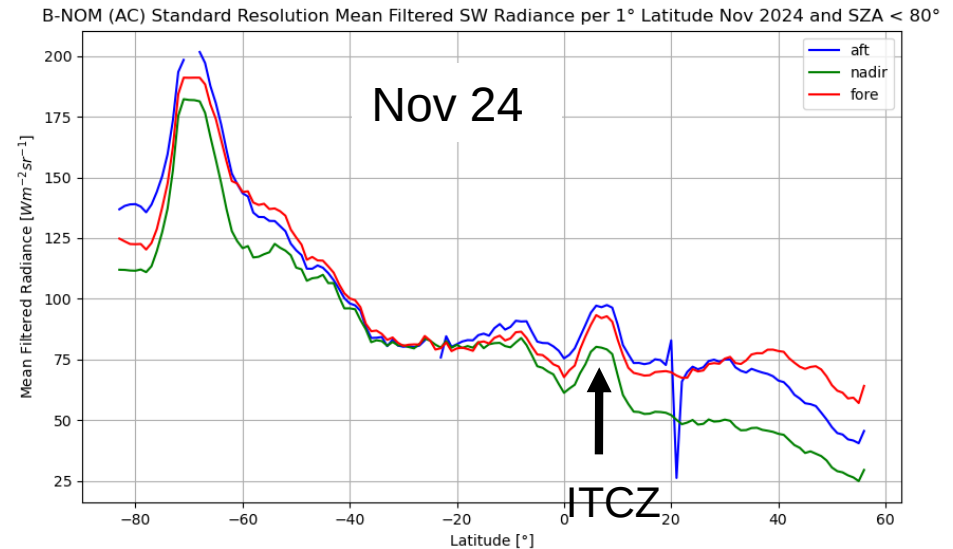
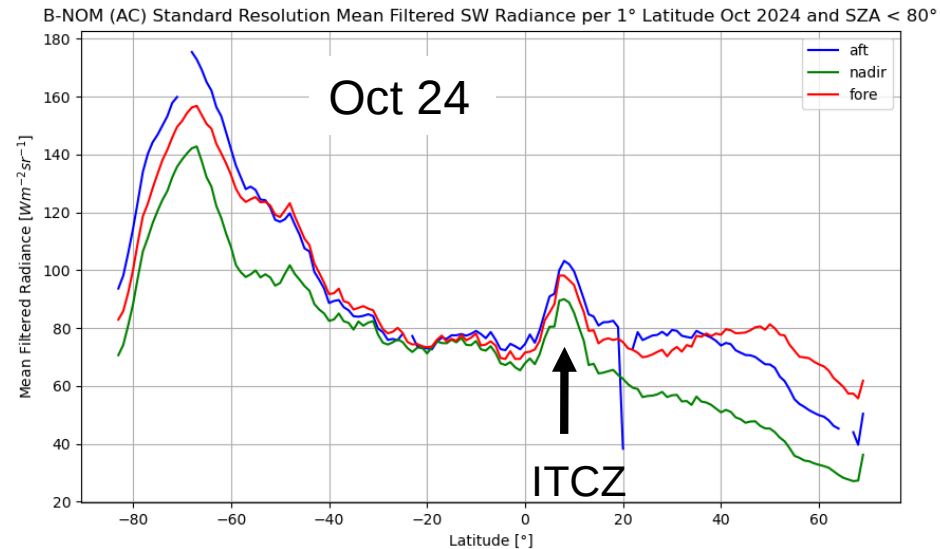
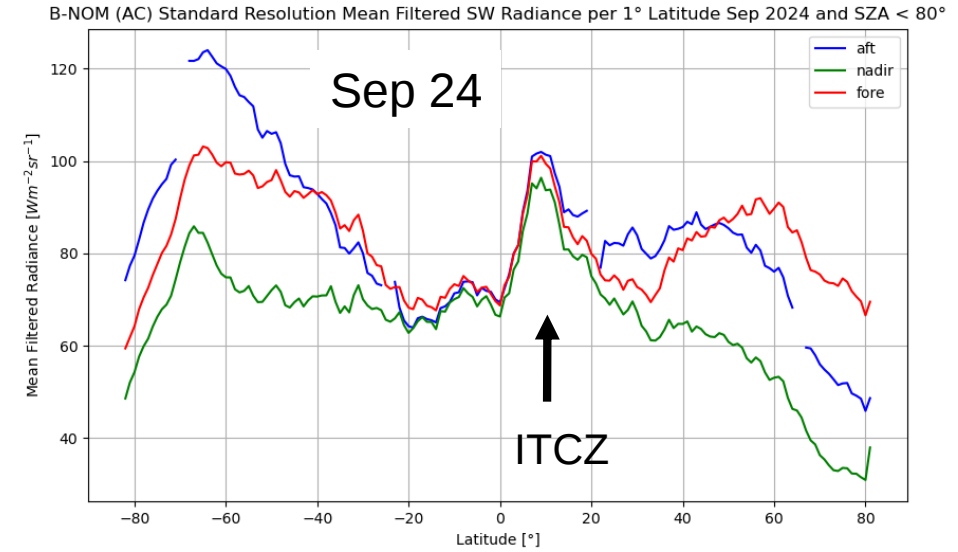
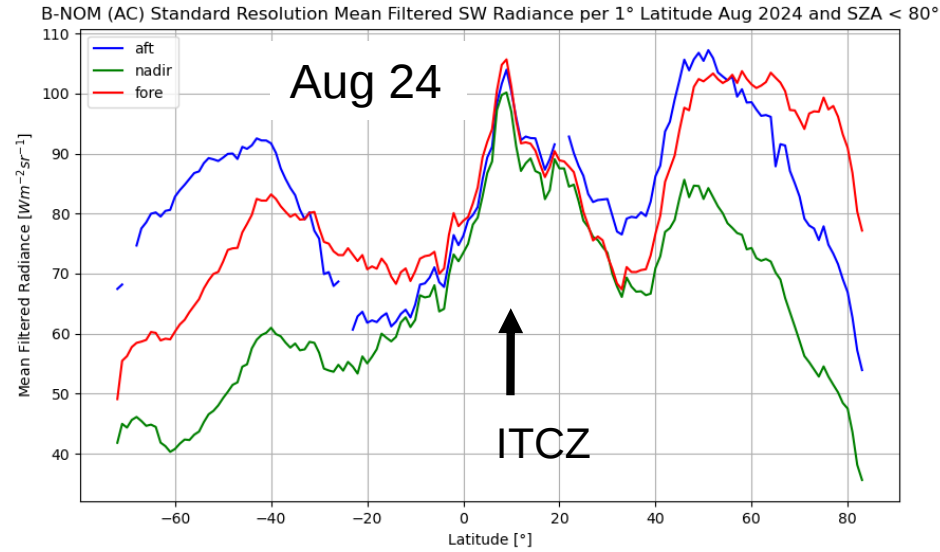
View	Mean	Std	Median
Aft	102.63	63.18	90.25
Nadir	86.73	62.94	69.48
Fore	100.33	62.10	89.79

WP2.2: B-NOM LW Radiance per 1° Lat. Bin, Aug - Nov 2024

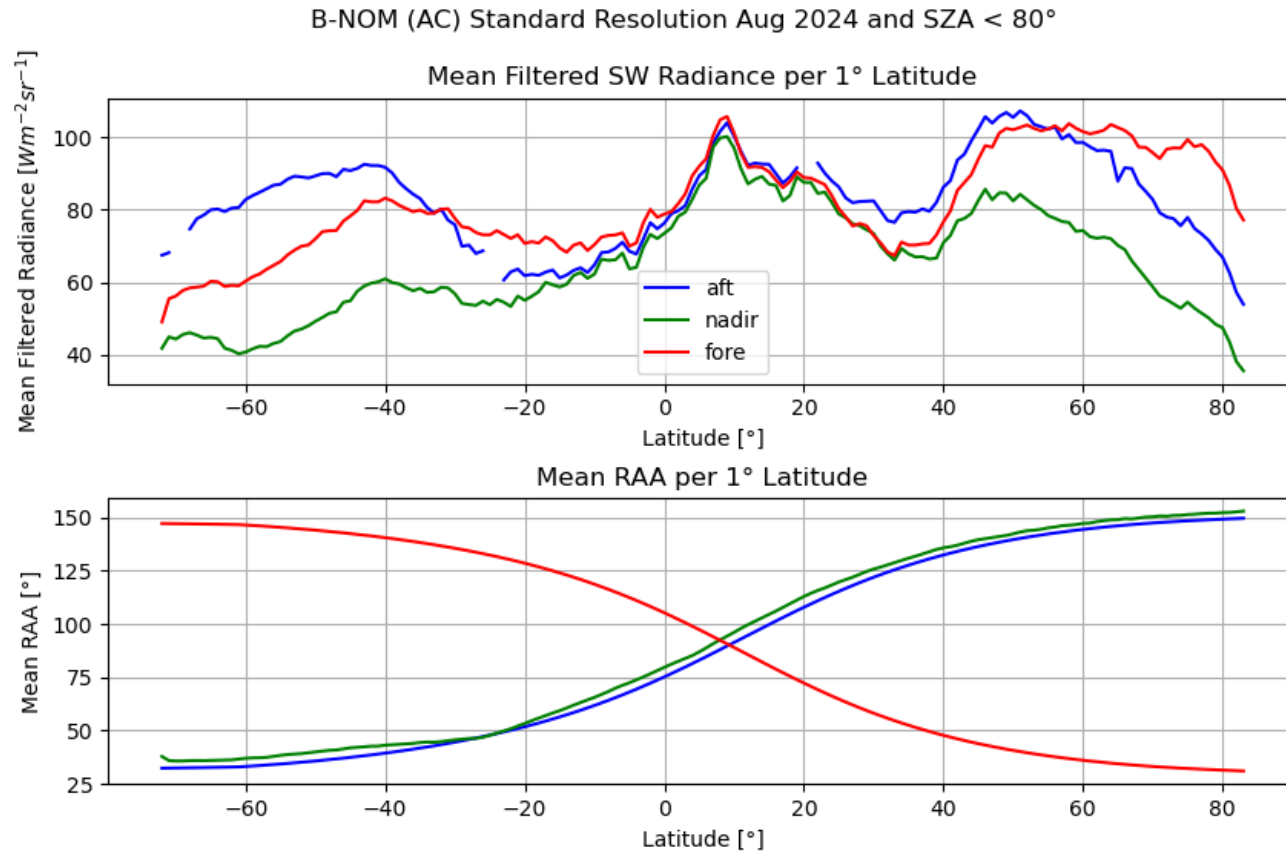


WP2.2: B-NOM SW Radiance per 1° Lat. Bin, Aug - Nov 2024

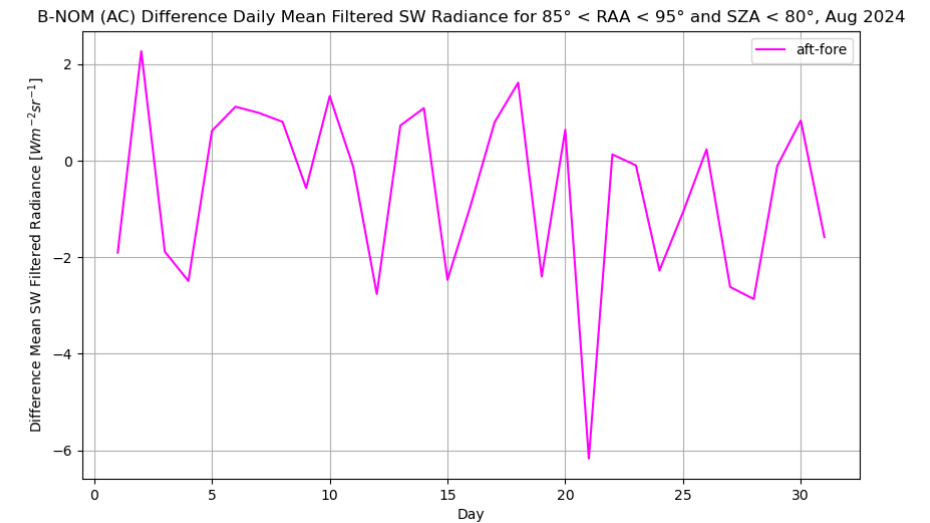
Daytime



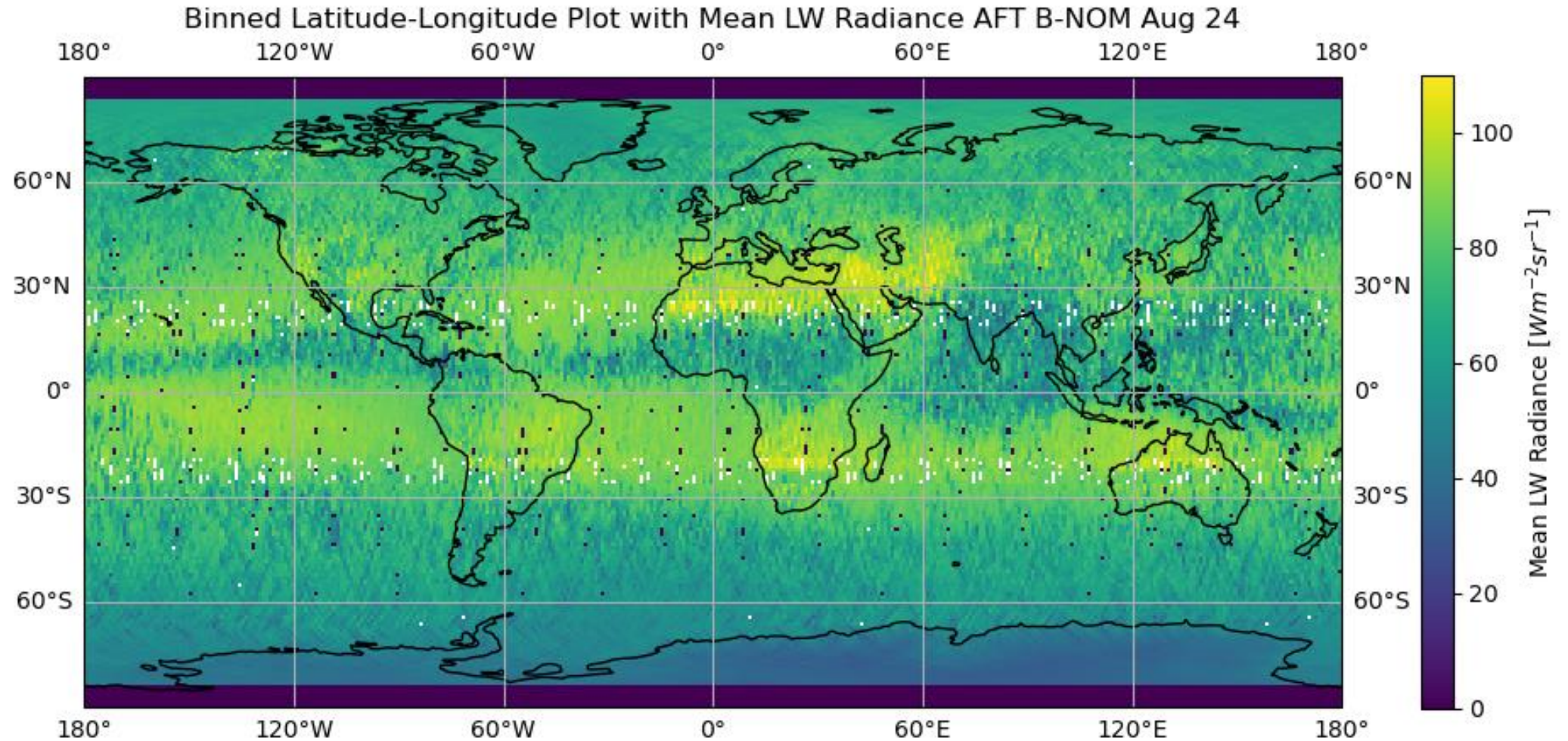
Daytime



Difference SW AFT – SW FORE for cases with RAA between 85° and 95°

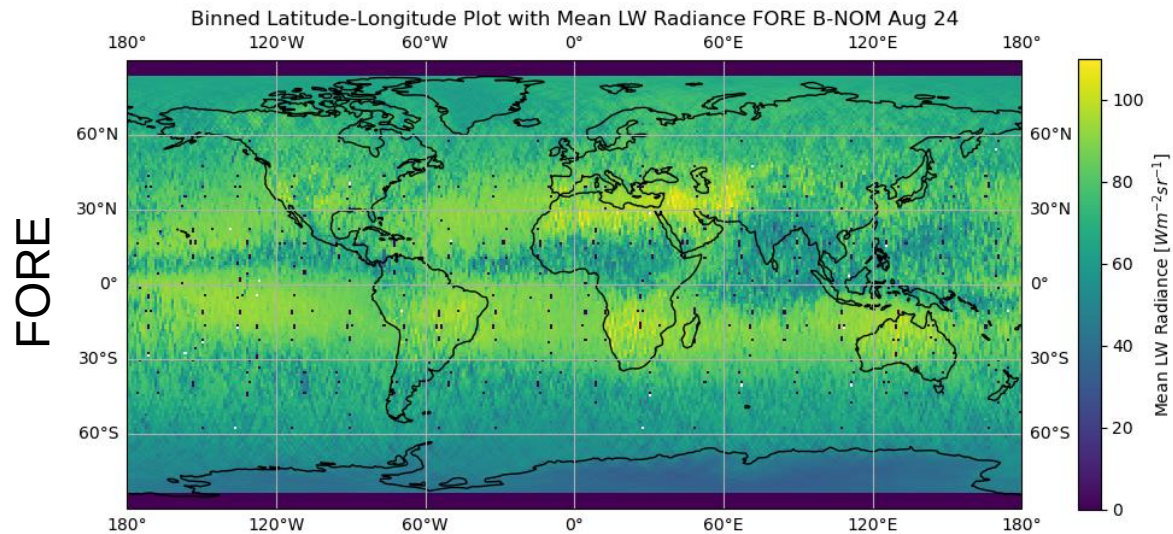
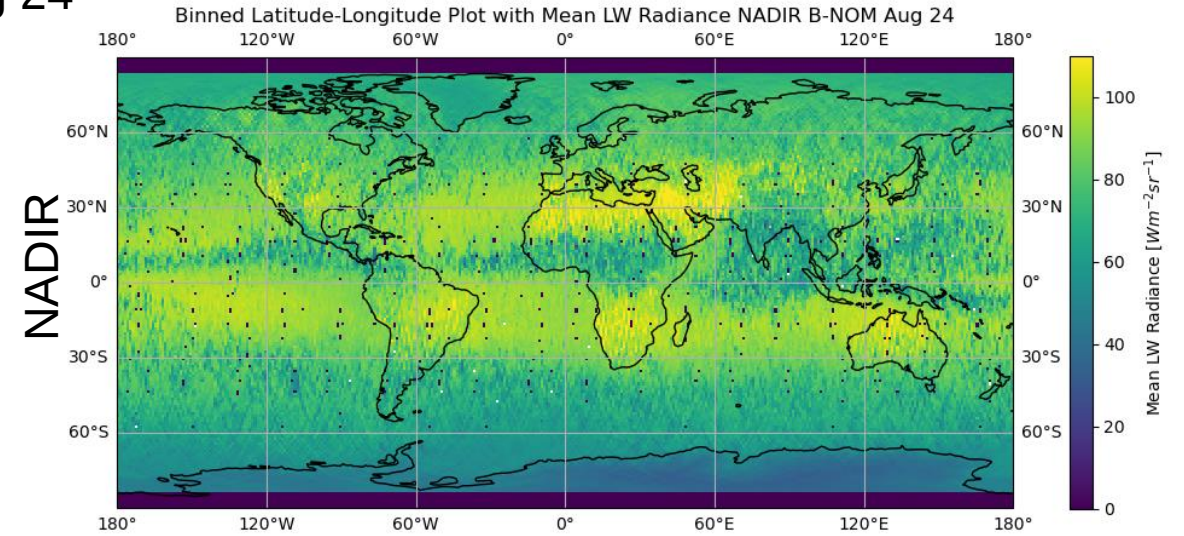
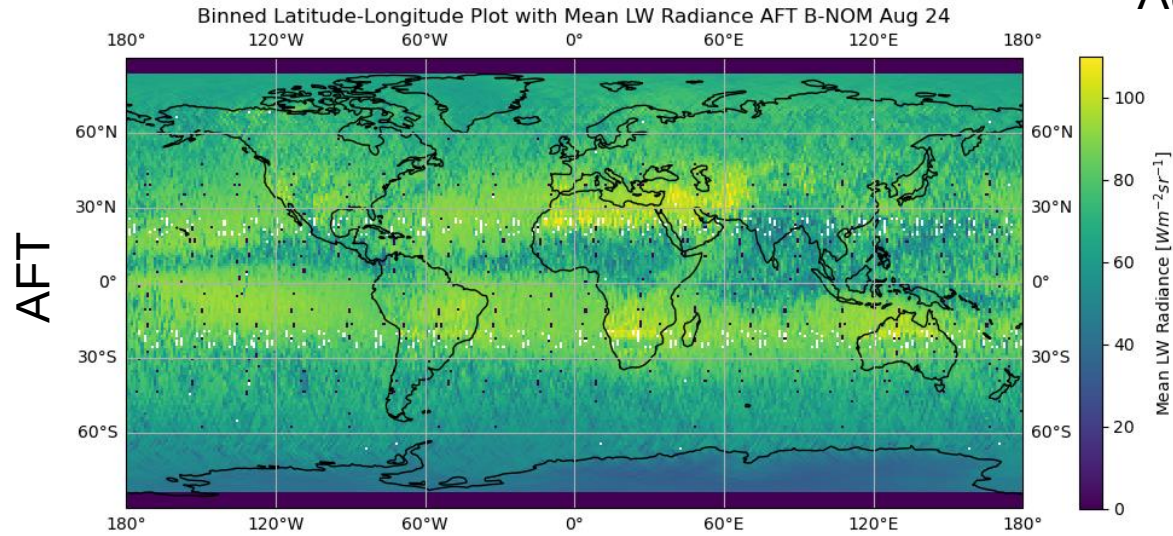


WP2.2: B-NOM LW Radiance per 1°x1° Lat.-Lon. Bin, Aug 2024



WP2.2: B-NOM LW Radiance per 1°x1° Lat.-Lon. Bin, Aug 2024

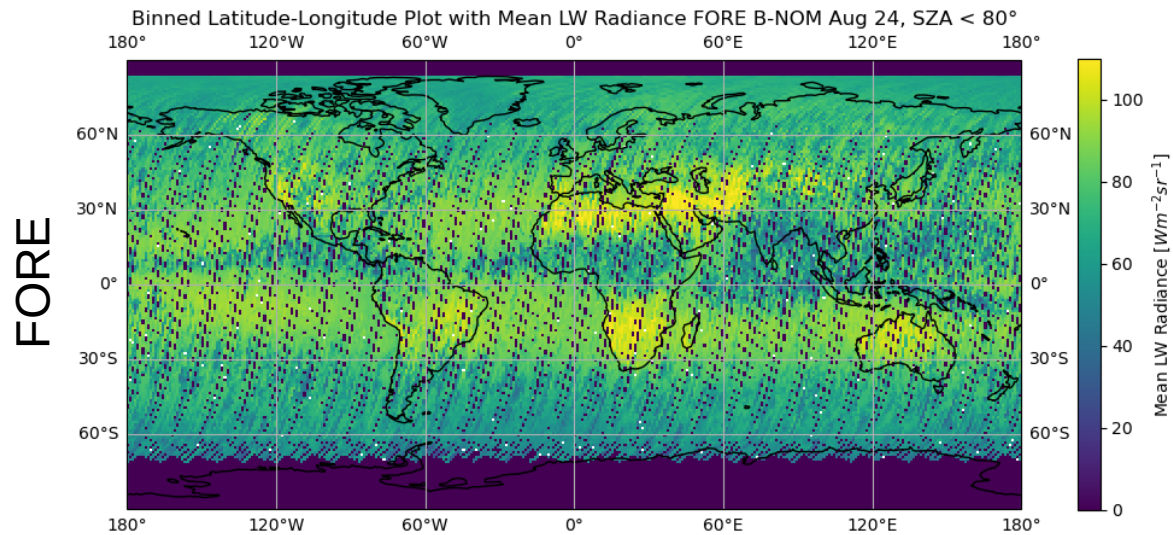
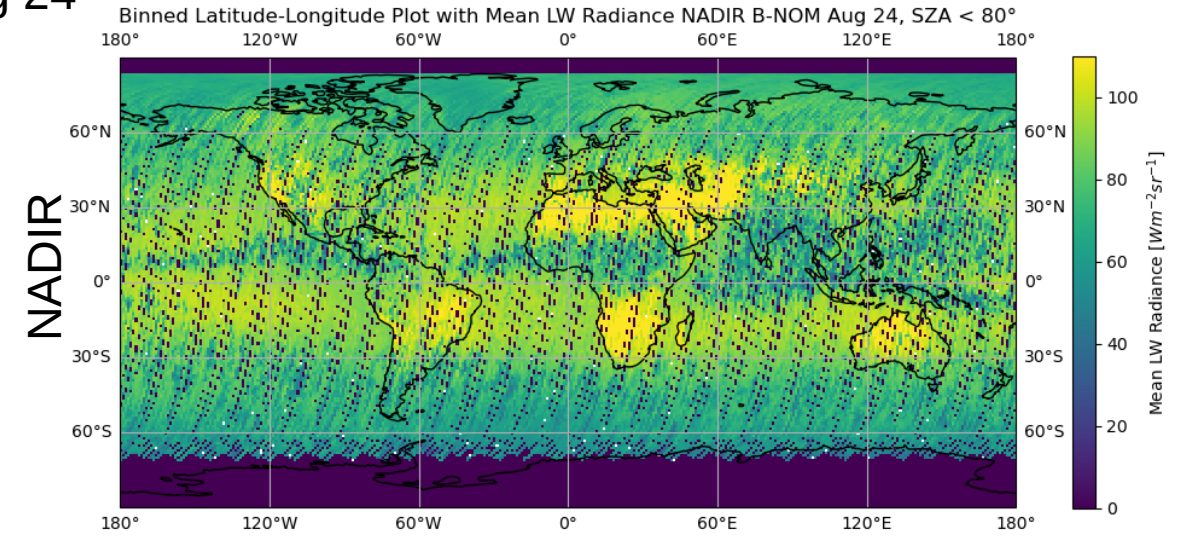
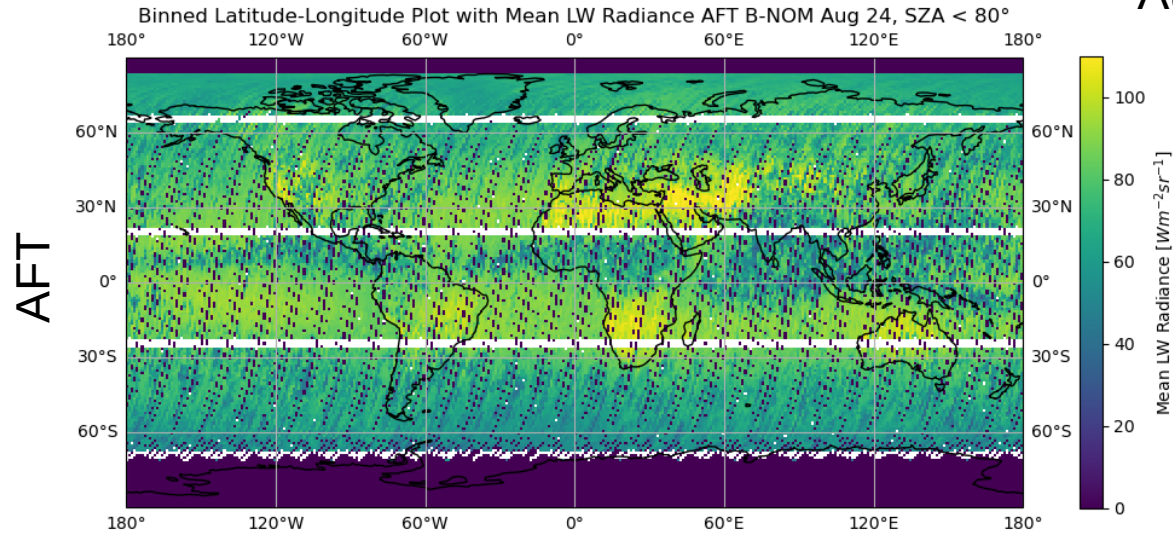
Aug 24



August 2024, all-day

WP2.2: B-NOM LW Radiance per 1°x1° Lat.-Lon. Bin, Aug 2024

Aug 24

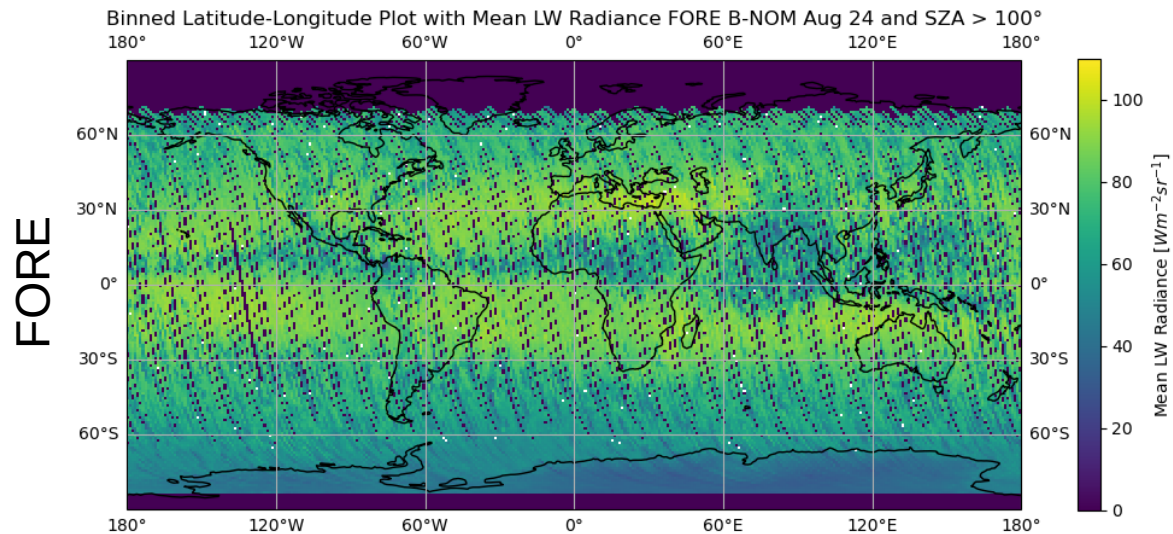
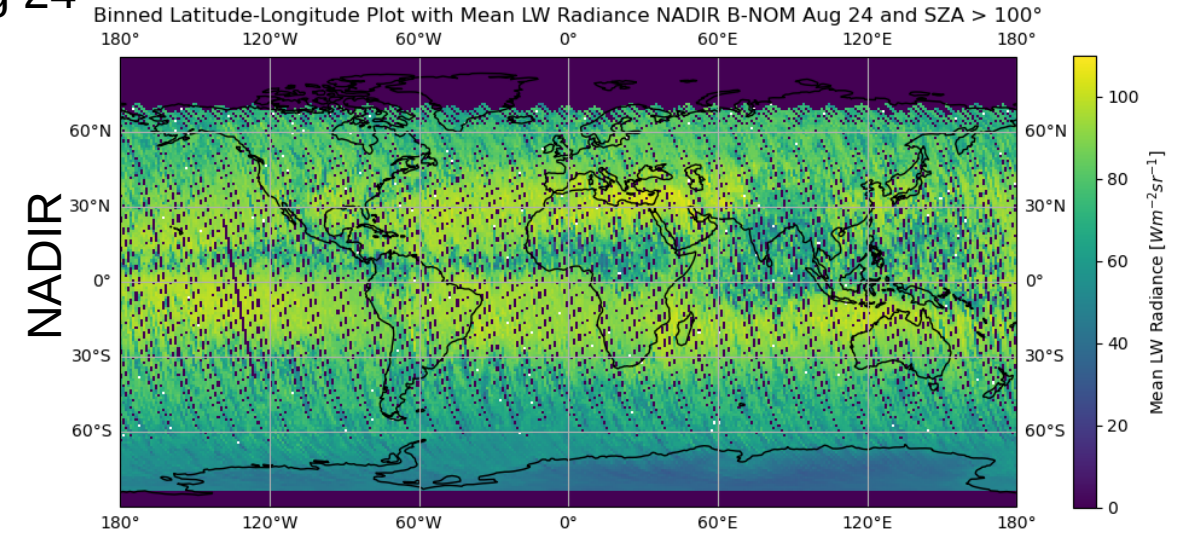
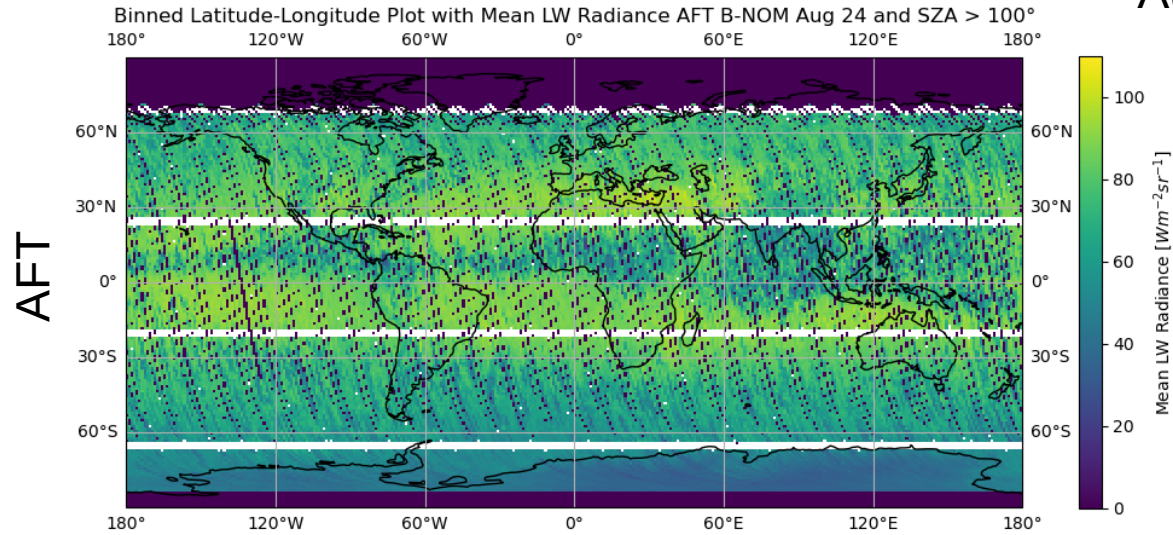


August 2024, daytime:

- SZA < 80°

WP2.2: B-NOM LW Radiance per 1°x1° Lat.-Lon. Bin, Aug 2024

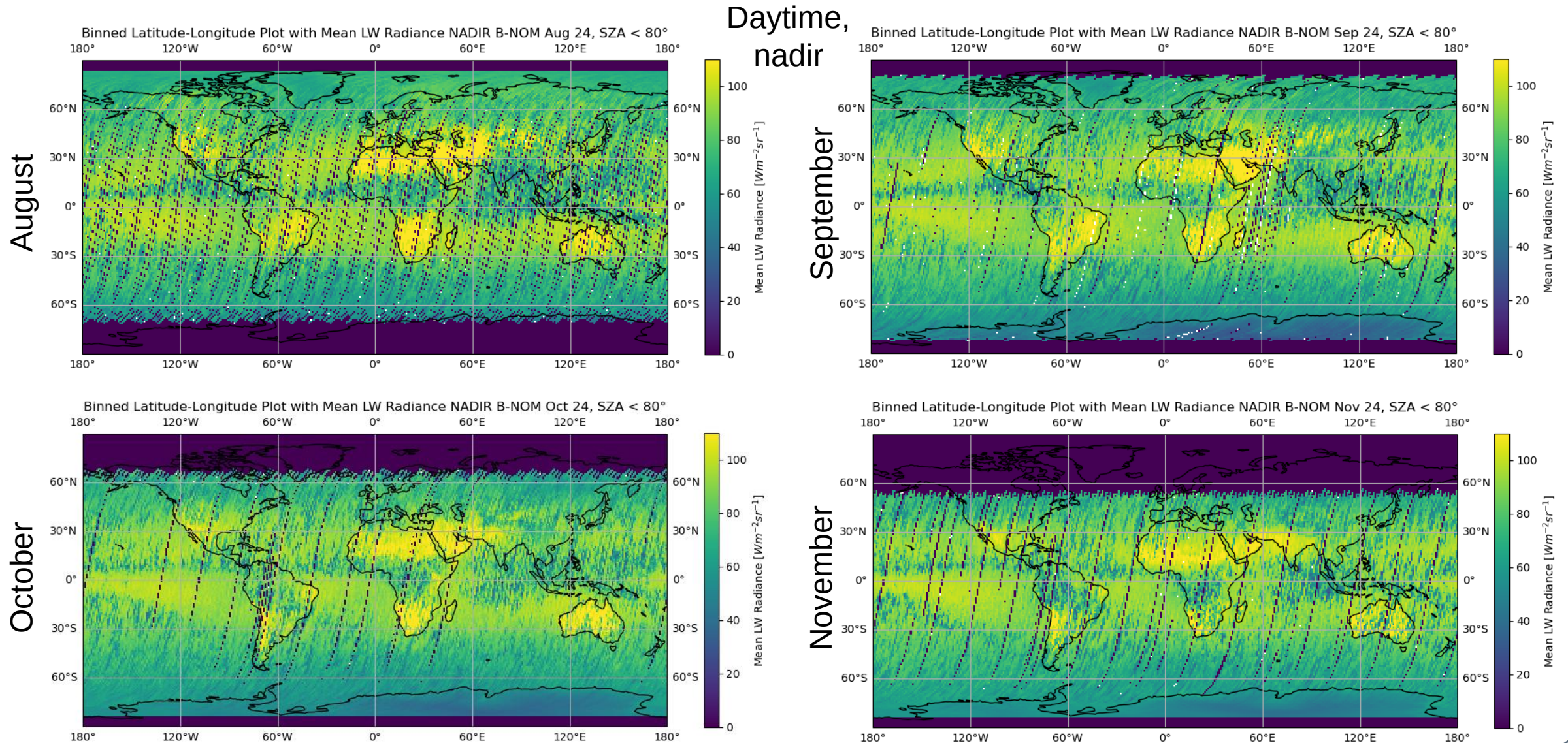
Aug 24



August 2024, nighttime:

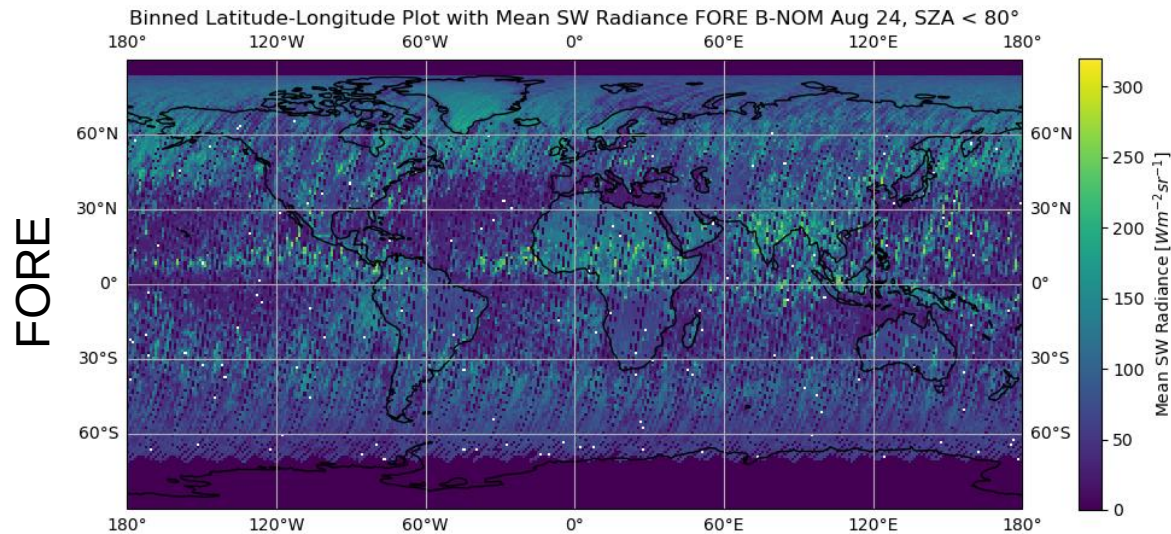
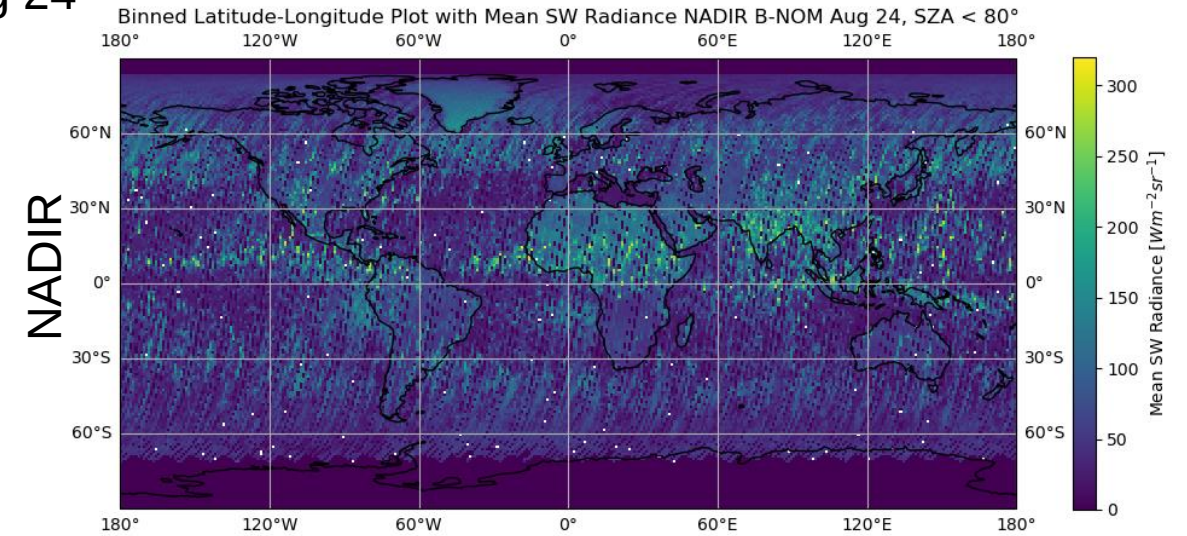
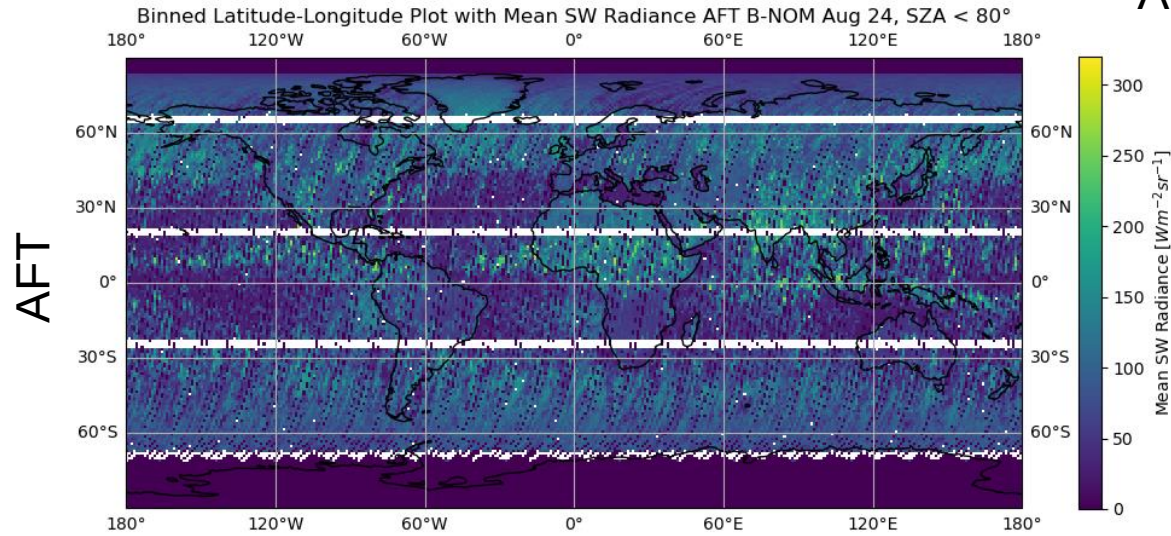
- SZA > 100°

B-NOM LW Radiance per 1°x1° Lat.-Lon. Bin, Aug - Nov 2024



WP2.2: B-NOM SW Radiance per 1°x1° Lat.-Lon. Bin, Aug 2024

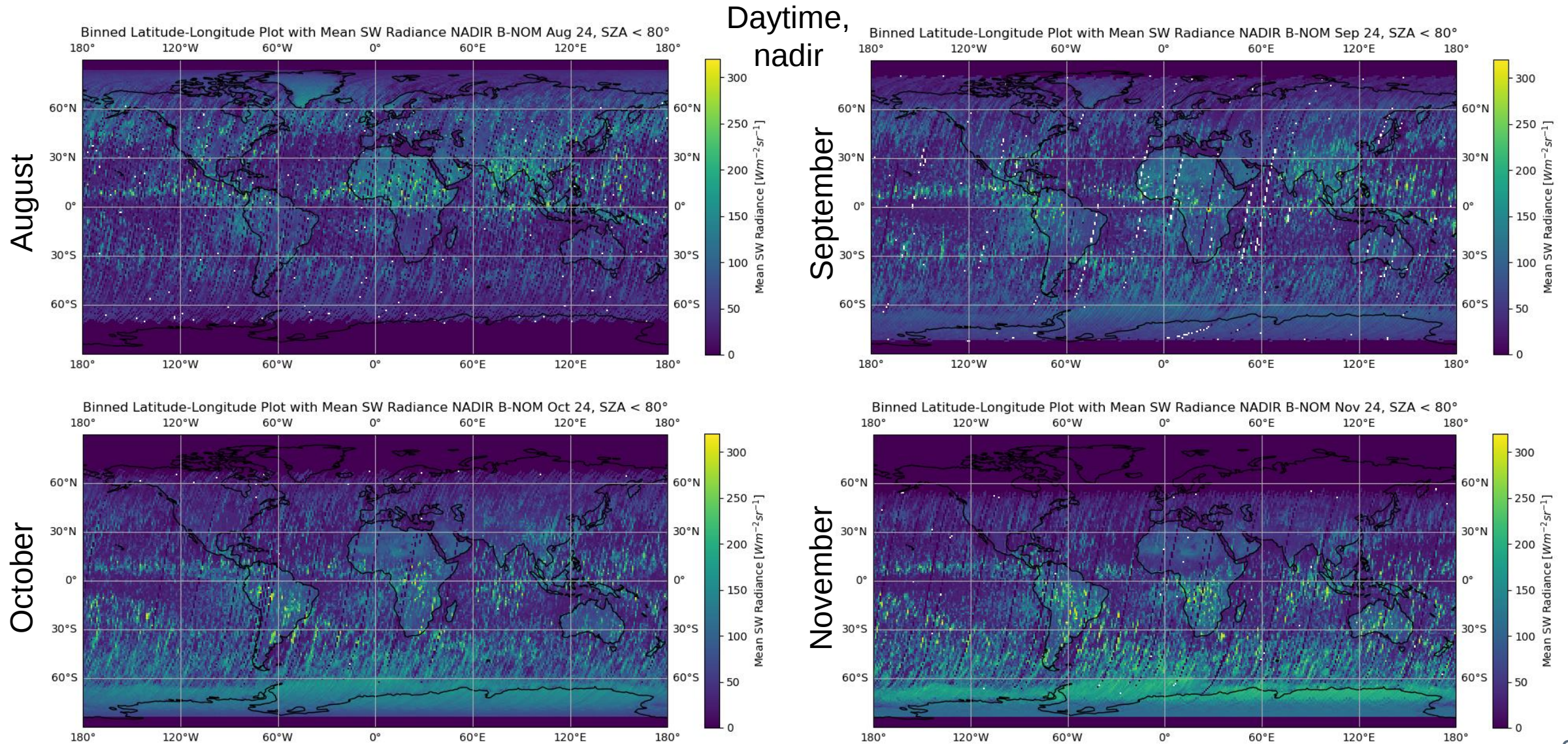
Aug 24



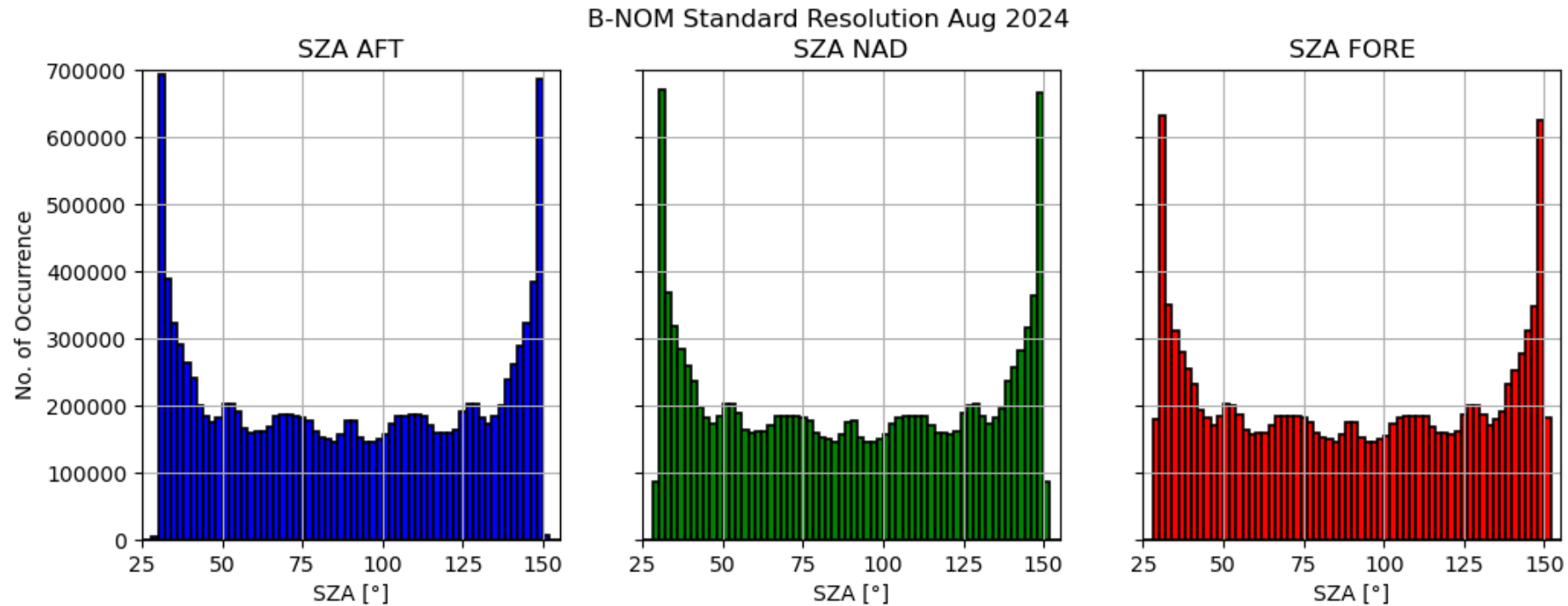
August 2024, daytime:

- SZA < 80°

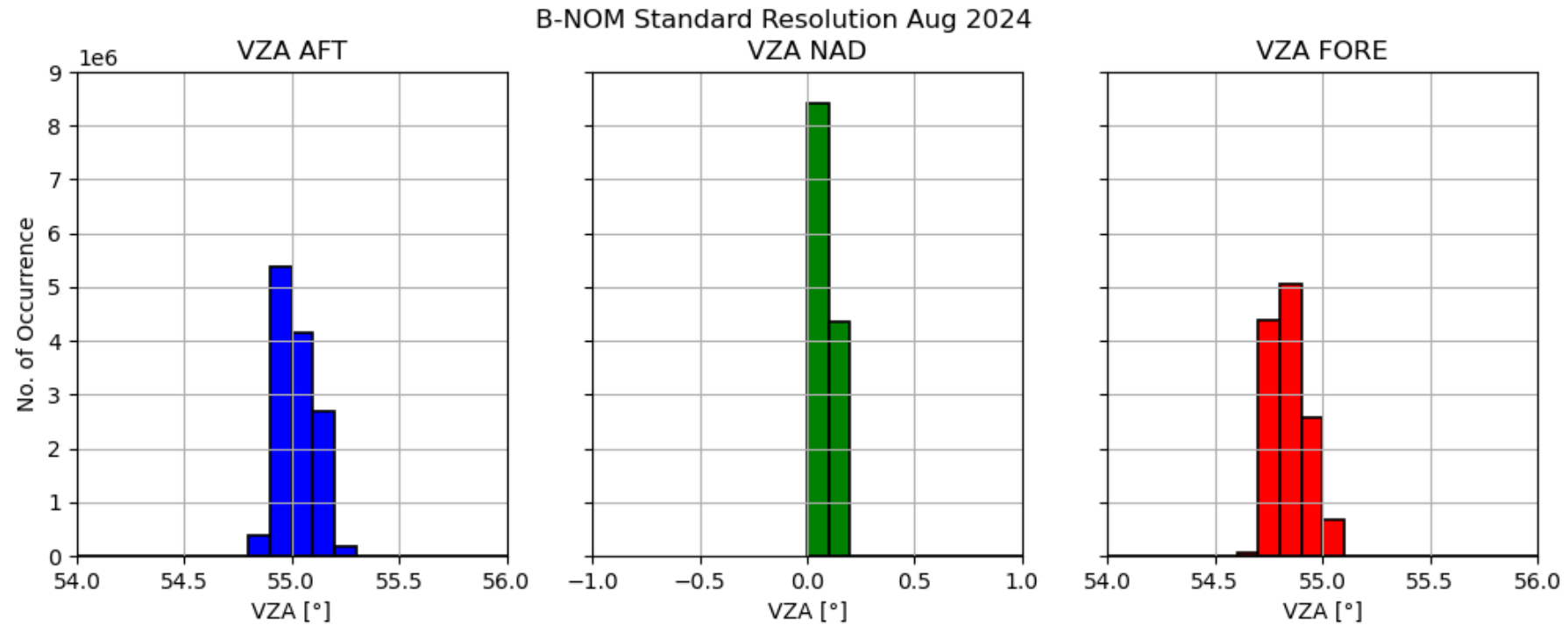
B-NOM SW Radiance per 1°x1° Lat.-Lon. Bin, Aug - Nov 2024



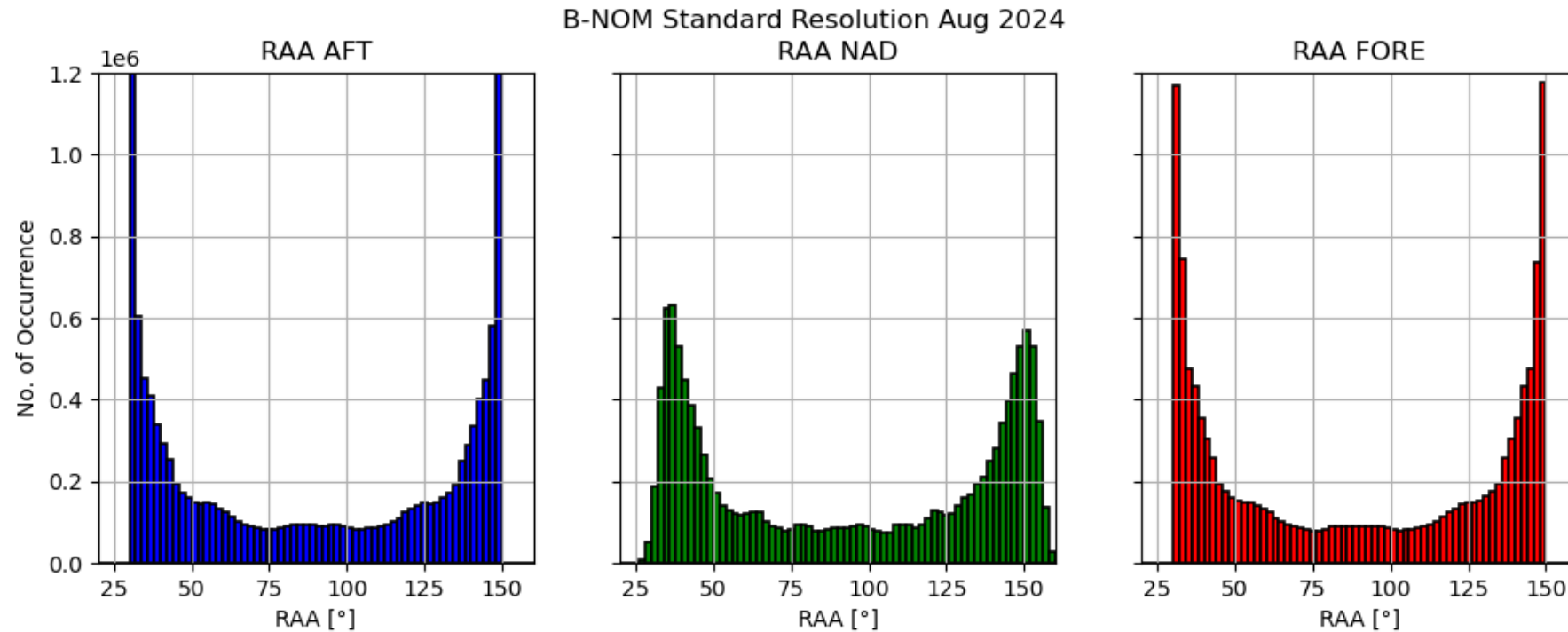
WP2.2: Distribution Solar Zenith Angle of the three views



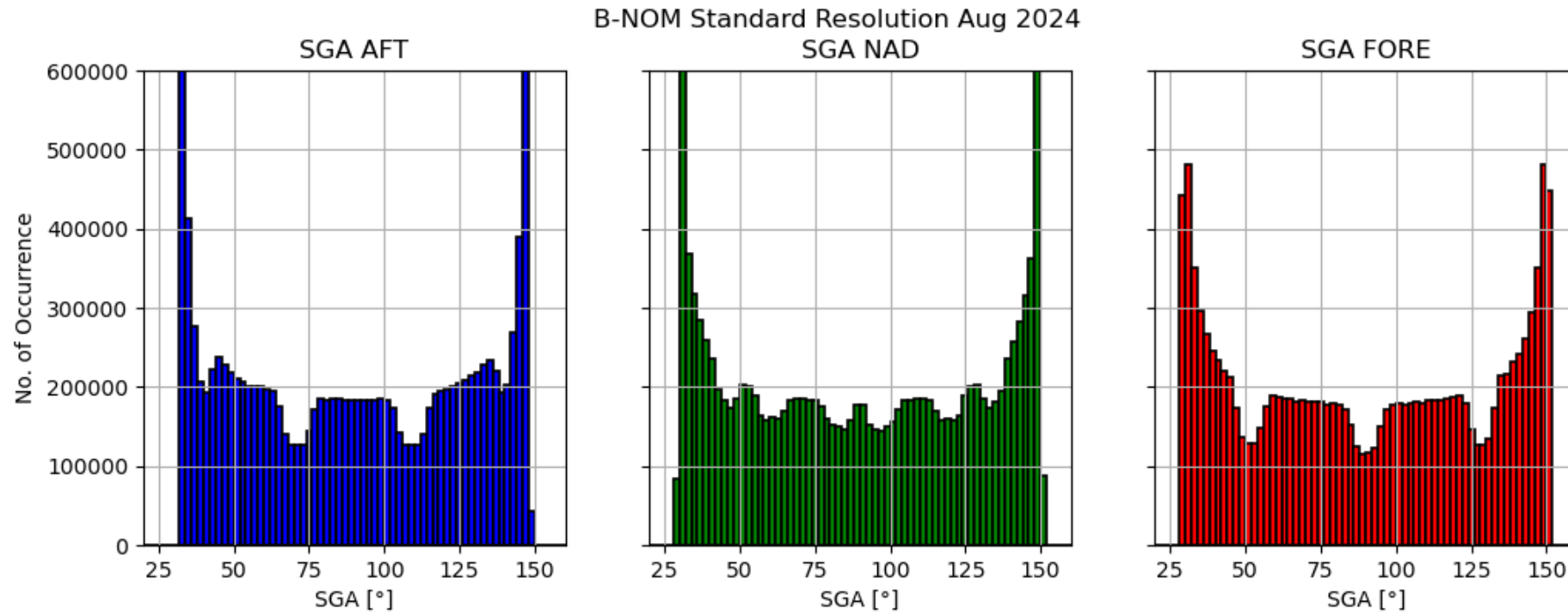
WP2.2: Distribution Viewing Zenith Angle of the three views



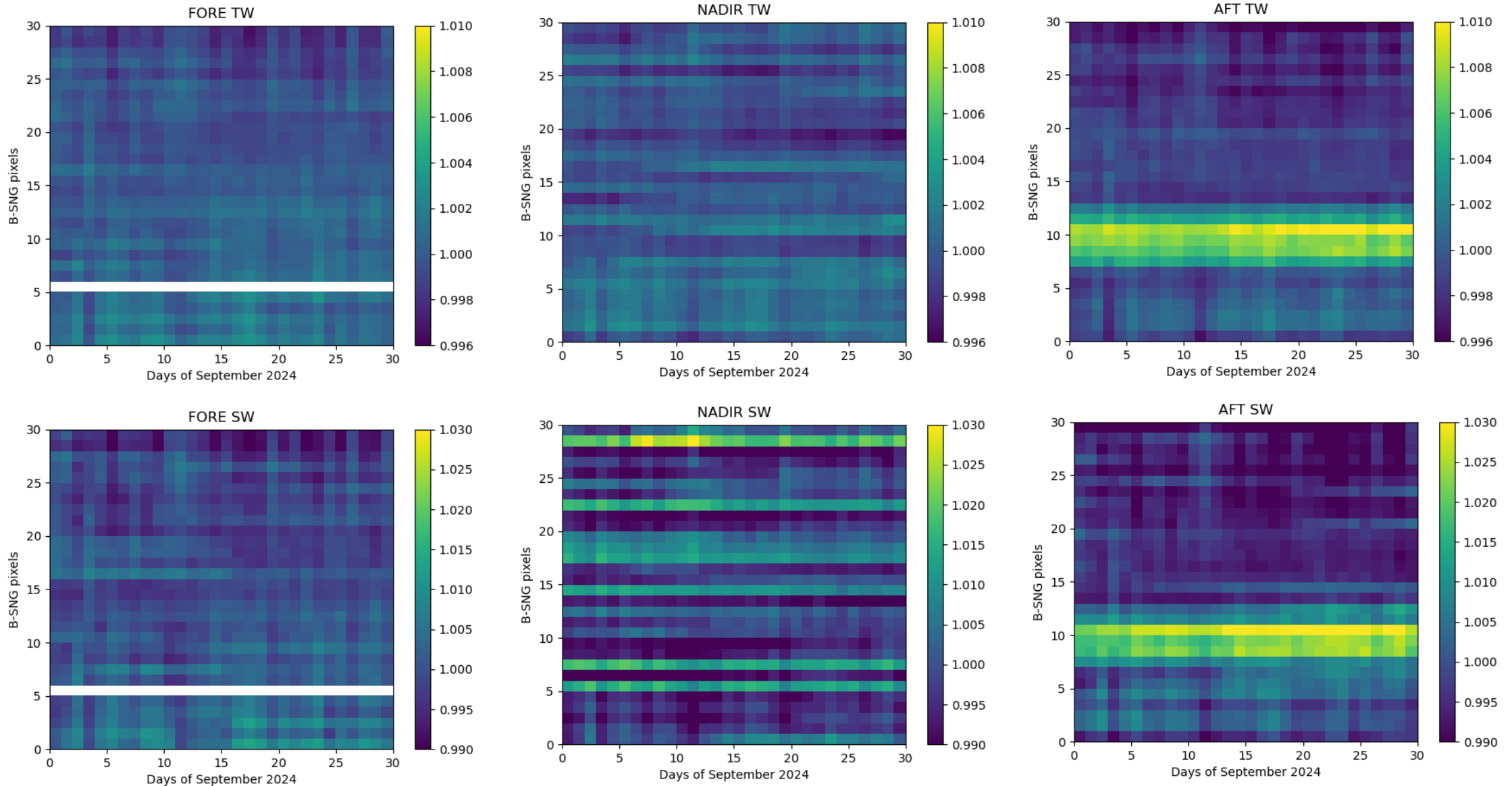
WP2.2: Distribution Relative Azimuth Angle of the three views



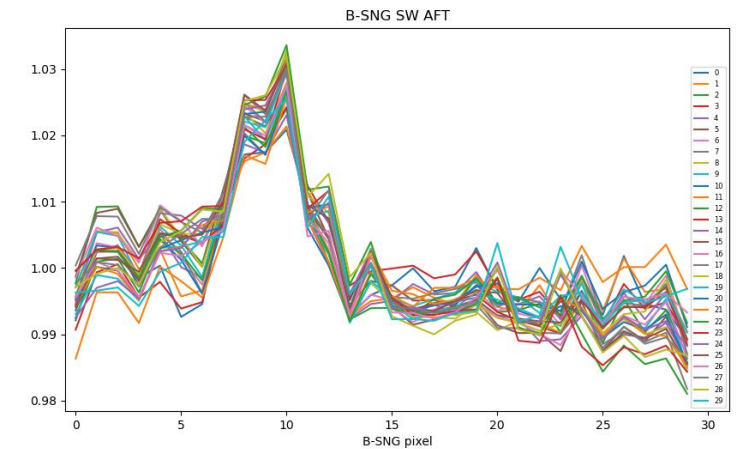
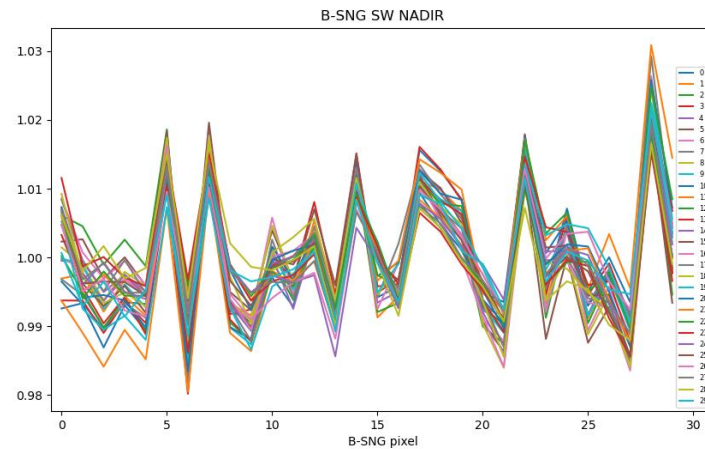
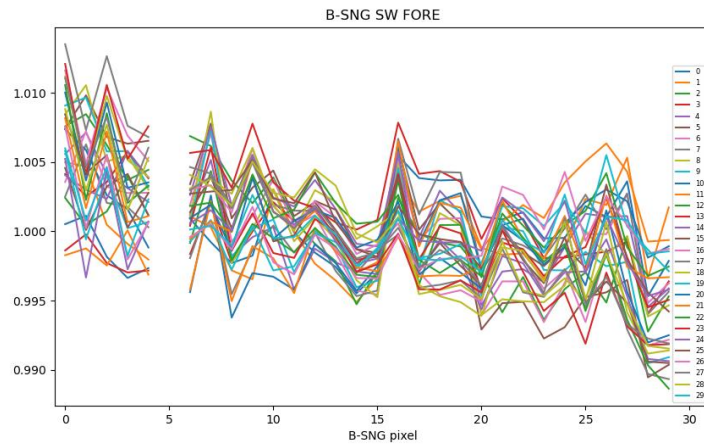
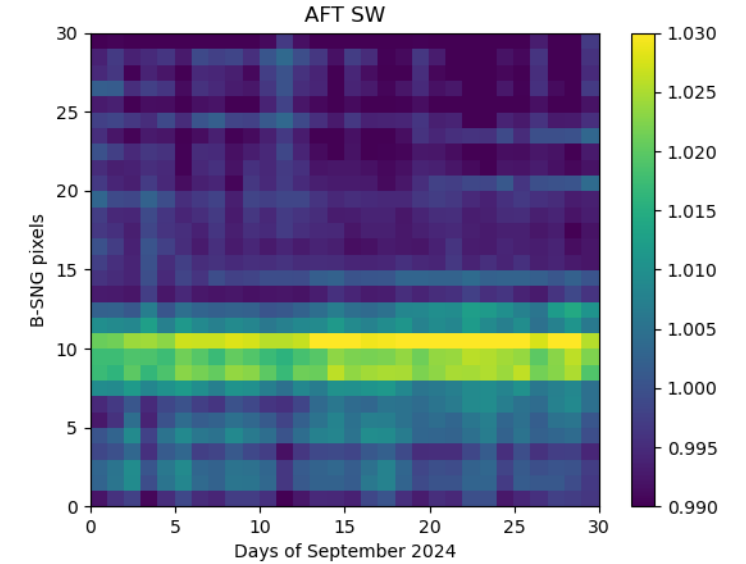
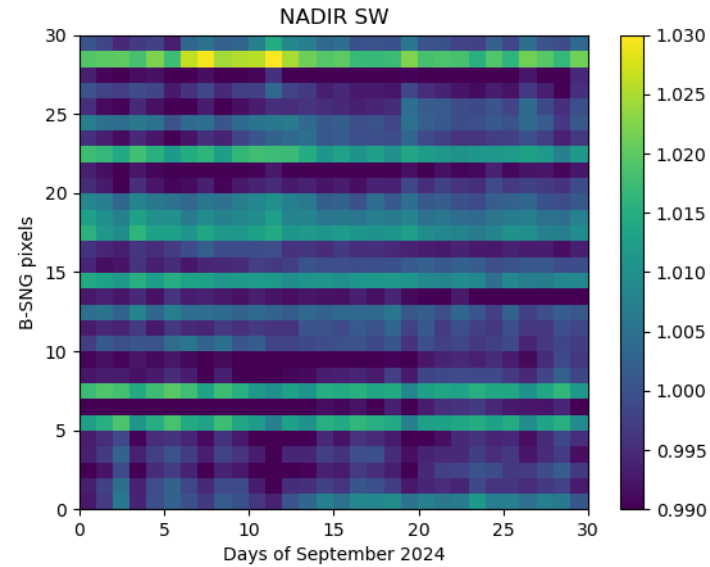
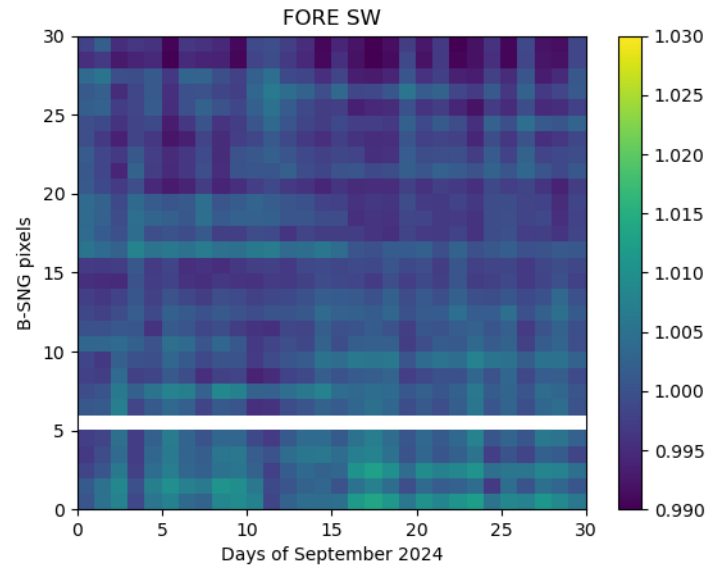
WP2.2: Distribution Sunlint Angle of the three views



WP2.2: B-SNG Analysis, TW and SW, Sep 2024



WP2.2: B-SNG Analysis, TW and SW, Sep 2024



WP2.3: Analysis/Visualisation of ratio between BBR and MSI-based BBR-like data

- This is ongoing, but nothing to be shown yet.
- Will be presented in the next meeting.

WP2.4: Additional Studies to address Extreme and Challenging Conditions

E.g. sun glint, high contrast changes during or close to the acquisition period

- There is no sun-glnt detected in the data.
- So far no studies about extreme or challenging conditions performed.
- Has to be reevaluated in the future whether there are topics for such studies.

- Continuation of the monitoring of various parameters.
- Analysis of the level-2 products BM-RAD and BMA-FLX data.
- Analysis of changes per month, per day?
- Continuation of the analysis with GERB and CERES data:
 - GERB is out of the sun avoidance season since middle of October 2024.
 - CERES SSF data are available until 01/08/2024.
- Presentation at the 1st ESA-JAXA EarthCARE In-Orbit Validation Workshop in January 2025
- Participation at the EarthCARE Validation Workshop in March 2025

Work Package number:	WP3
Work Package Title:	Accuracy assessment of unfiltered radiances L2 BM-RAD product.
Responsible entity:	RMIB
WP responsible person	Aebi
Project phases (0,A,B,C,D,E):	E
Beginning and end dates of WP	01.12.2024 – 31.12.2025
Total FTE allocated to the WP	13 PM (1.08 FTE)
Objectives of the WP: Quantitative evaluation of the L2 BM-RAD radiance product, so establishing input data quality for the BBR flux estimation.	
Inputs: - Tools from WP1. - L2 BM-RAD data (commissioning and beyond) - CERES (SSF) and GERB (HR) data Description of work and schedule: - Basic, qualitative, evaluation of the BM-RAD product, including visualization (context from MSI images). - Comparison unfiltered radiances with the Earth targets defined in WP1. - Comparison with coangular co-incident observations from GERB and CERES to assess absolute level (calibration), and scene type consistency (spectral response/unfiltering). - Long term stability monitoring of the instrument response will be established using stable Earth targets. Excluded tasks: Deliverables and dates: - Matched databases of coangular radiances for reference and further analysis (30.06.2025). - BBR L2a quantitative assessment report (31.12.2025). - Recommendation for BM-RAD processor evolution. Risks: Availability of co-angular collocated observations from CERES RAPS campaigns	