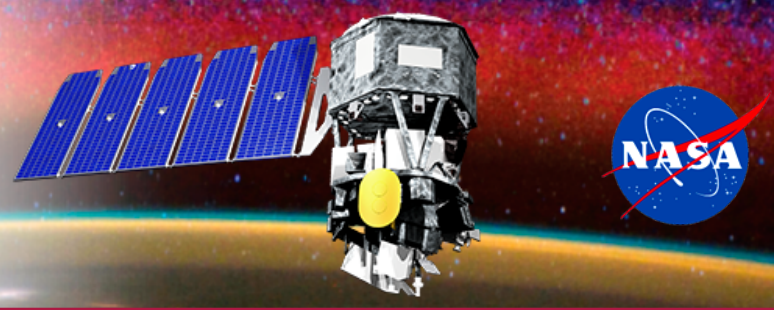


ICON

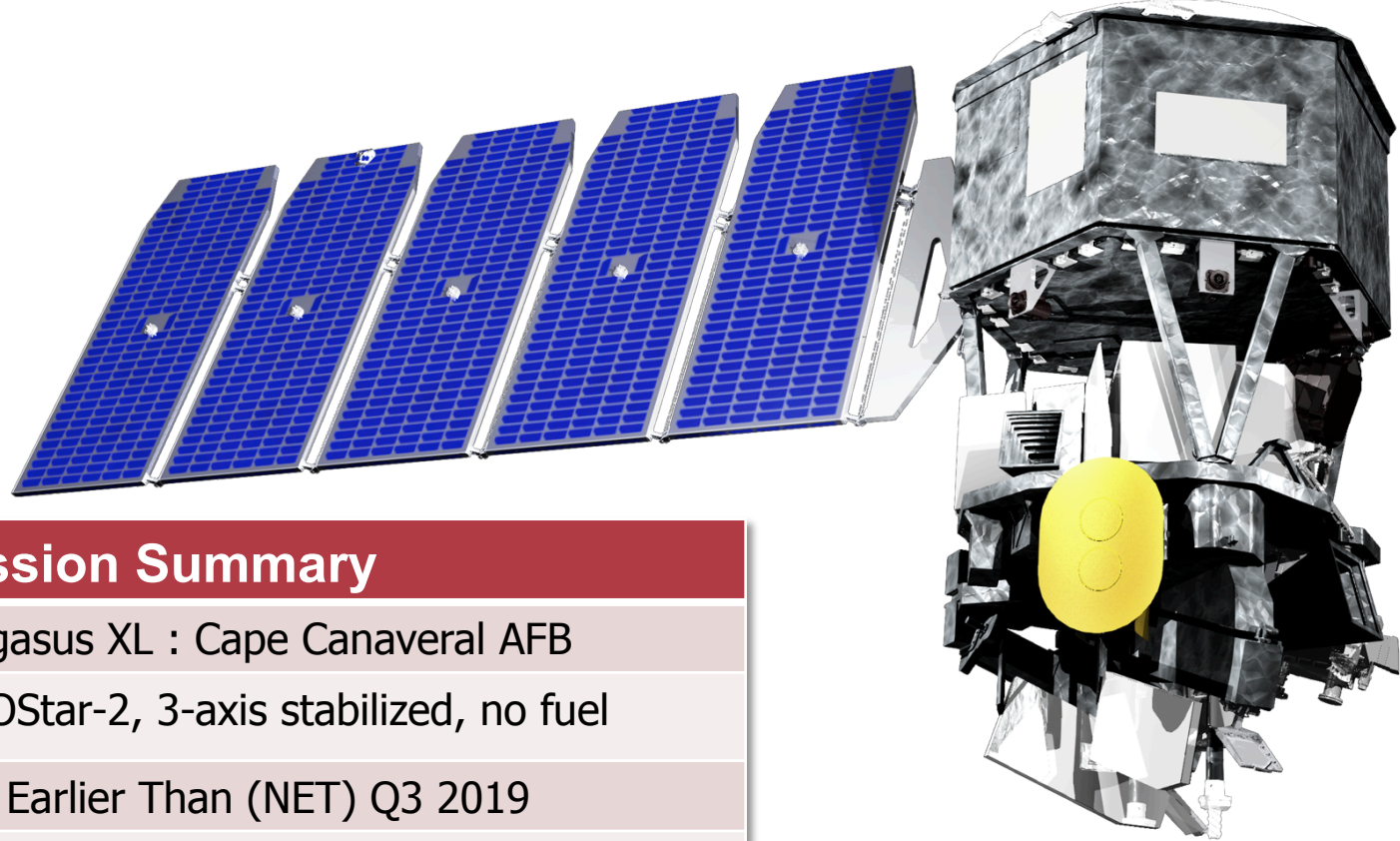
Ionospheric Connection Explorer



ICON GEM-CEDAR Update

Thomas J. Immel, Colin Triplett
UC Berkeley

ICON Implementation Quicklook



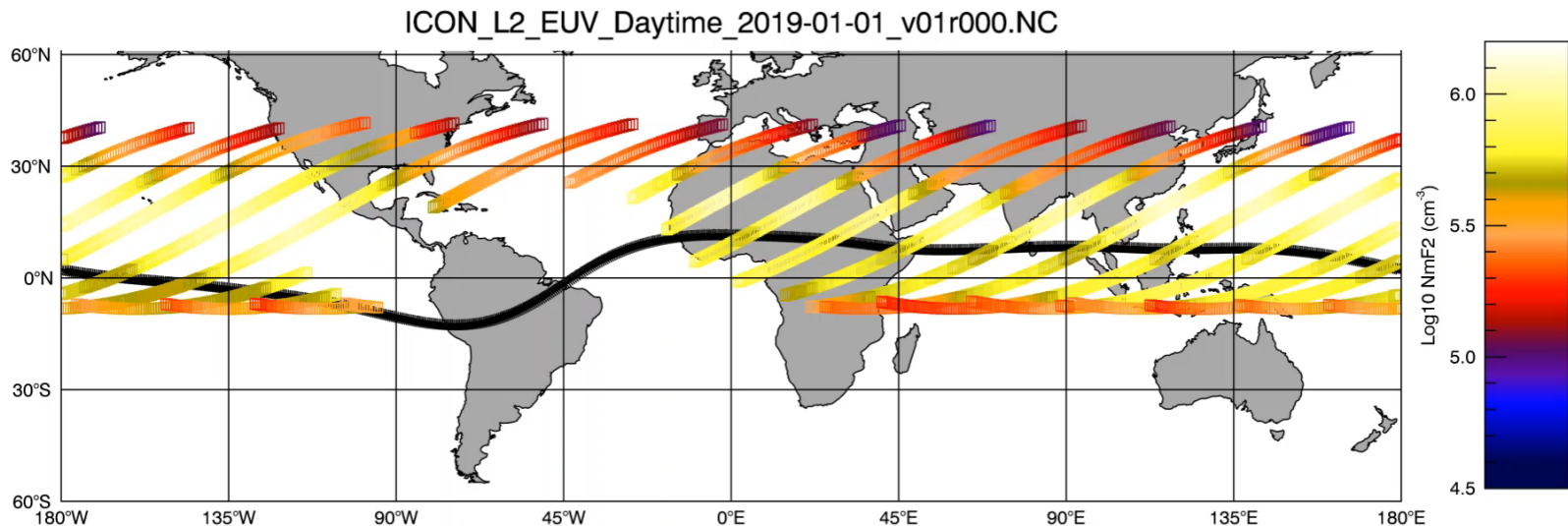
Mission Summary

Launch vehicle	Pegasus XL : Cape Canaveral AFB
Spacecraft	LEOSTar-2, 3-axis stabilized, no fuel
Launch	No Earlier Than (NET) Q3 2019
Orbit	575 km circular, 27° inclination , 27-day half precession
Communications	S-band to Berkeley, Wallops, Santiago
Instruments	MIGHTI, FUV, EUV, and IVMs



ICON Activity #1 – Complete Product Set

- ❑ The ICON mission continues to wait for the launch vehicle to be ready.
- ❑ This provides an opportunity to research many different observational scenarios for the mission.
- ❑ The science team has created synthetic versions of all Level 2 products to develop processing/analysis techniques, and test assimilation of products to Level 4.



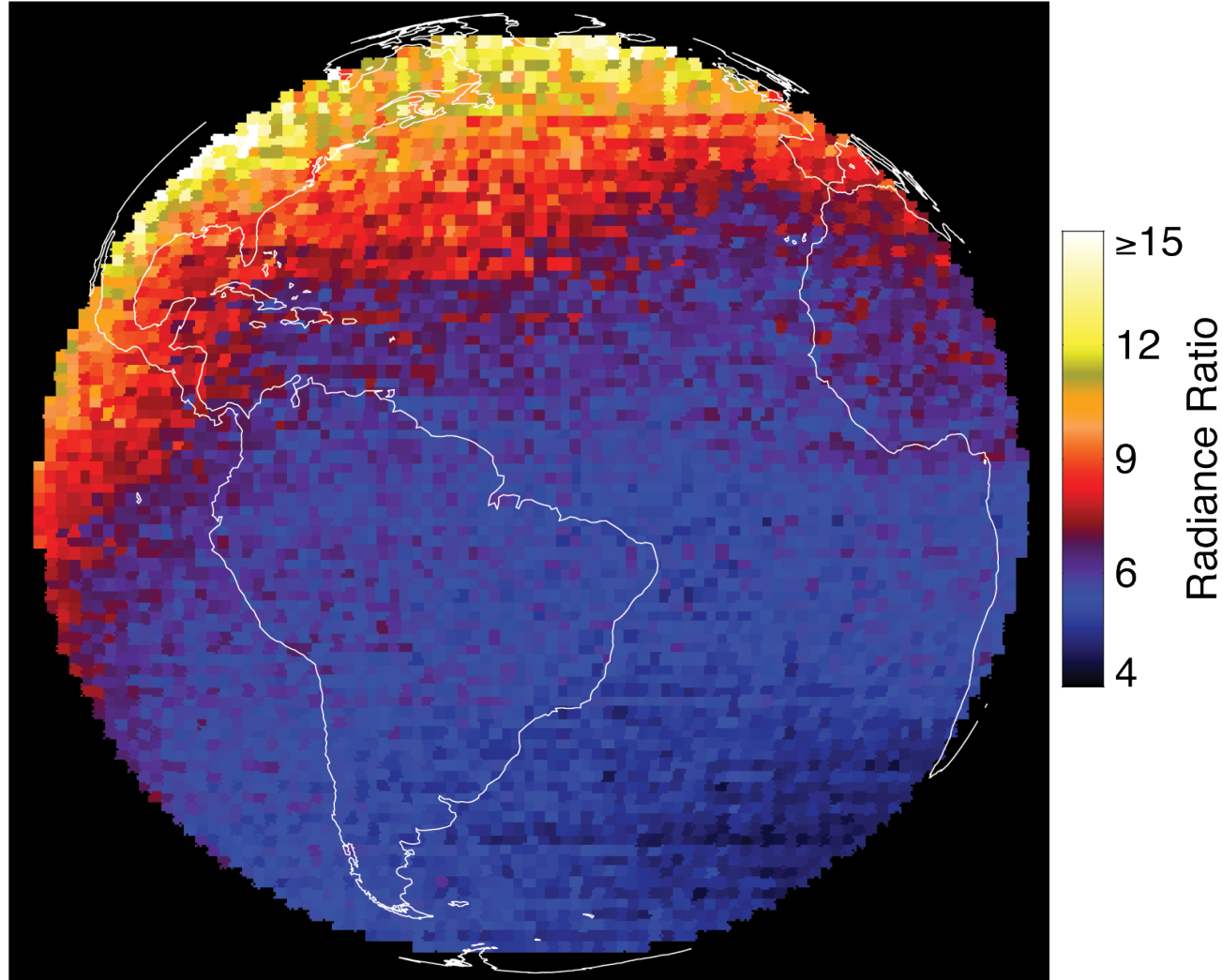
Activities - #2 Prep for GOLD-ICON

GOLD 1356/LBH 2019, Day 007 (1/7), 14 UT

Emission ratio provides a rough proxy for O/N₂.

Comparison of this ratio to ICON O/N₂ is performed for Days 1-40, 2019, for a realistic ICON ephemeris.

We use a MERRA-TIMEGCM-based TIEGCM run.

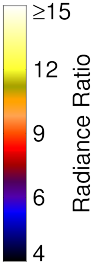
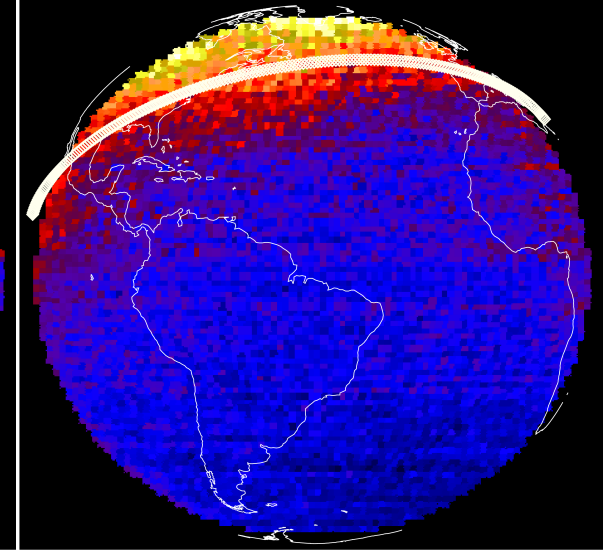
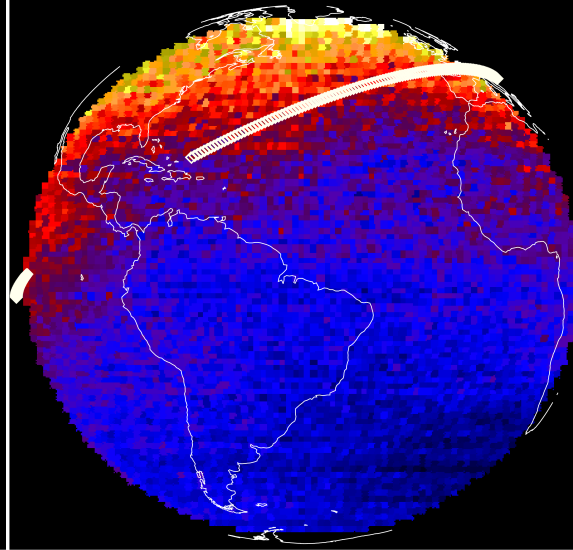
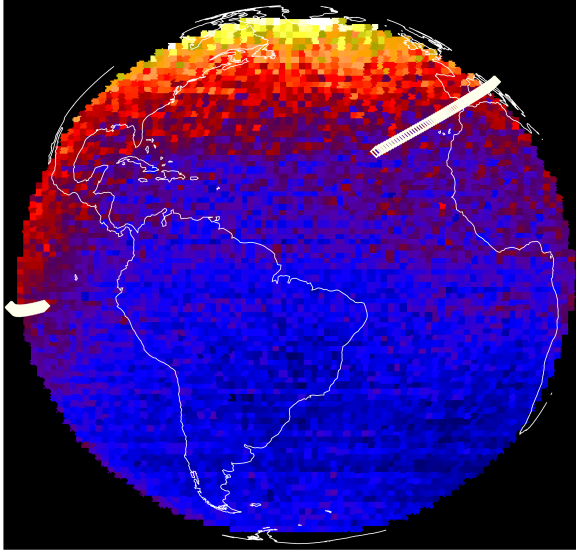


ICON/GOLD LVLH, and Reverse LVLH, Jan 2019

GOLD 1356/LBH 2019, Day 002 (1/2), 15 UT

GOLD 1356/LBH 2019, Day 007 (1/7), 15 UT

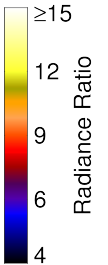
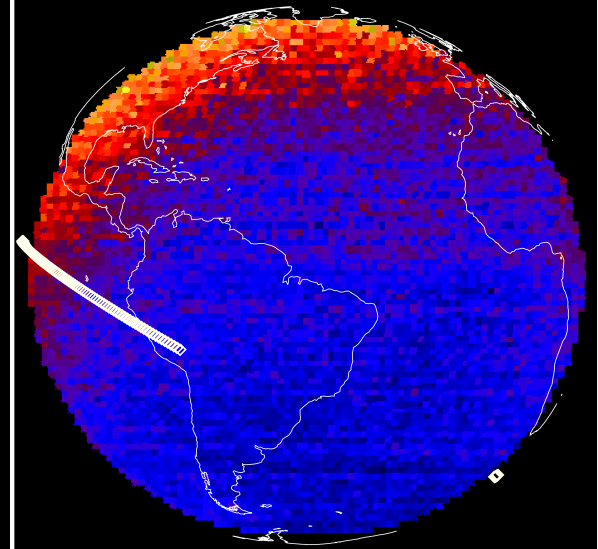
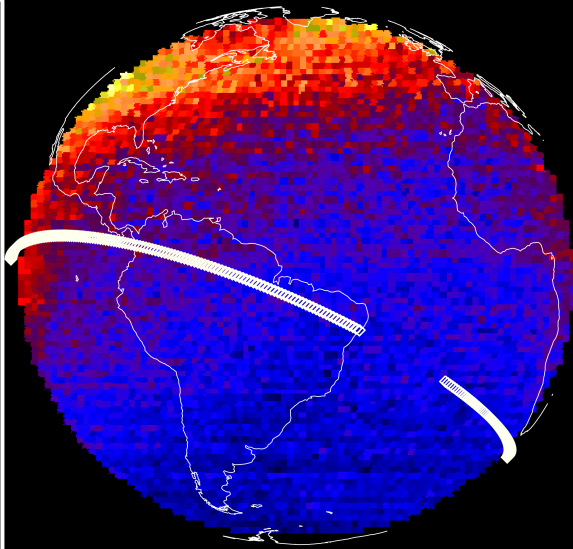
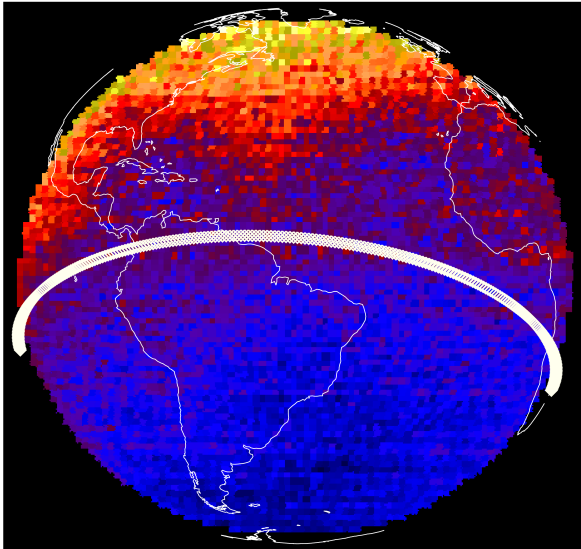
GOLD 1356/LBH 2019, Day 013 (1/13), 15 UT



GOLD 1356/LBH 2019, Day 017 (1/17), 15 UT

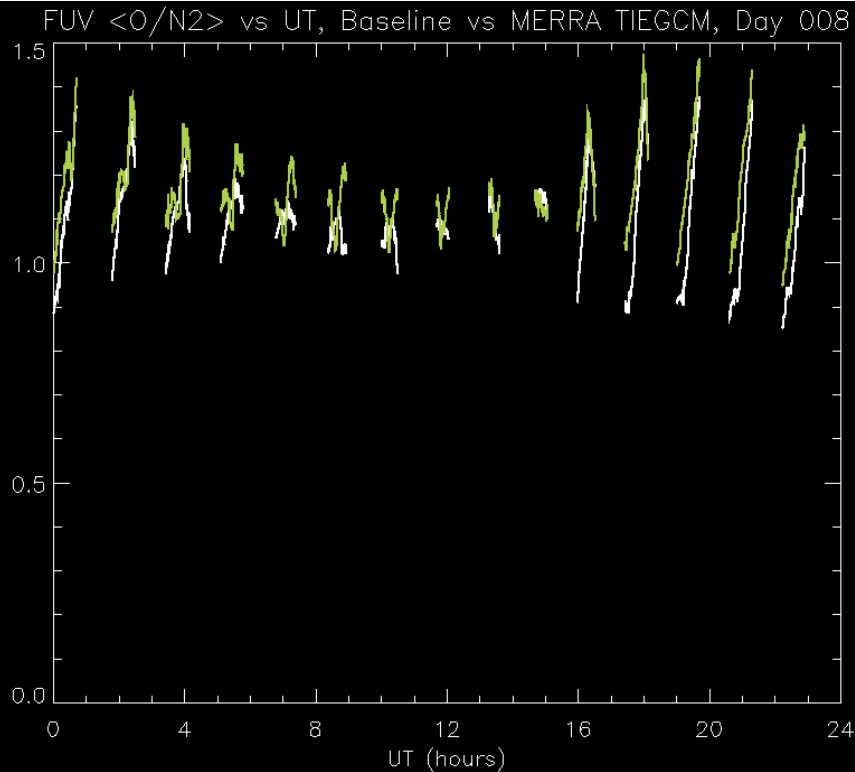
GOLD 1356/LBH 2019, Day 023 (1/23), 15 UT

GOLD 1356/LBH 2019, Day 029 (1/29), 15 UT

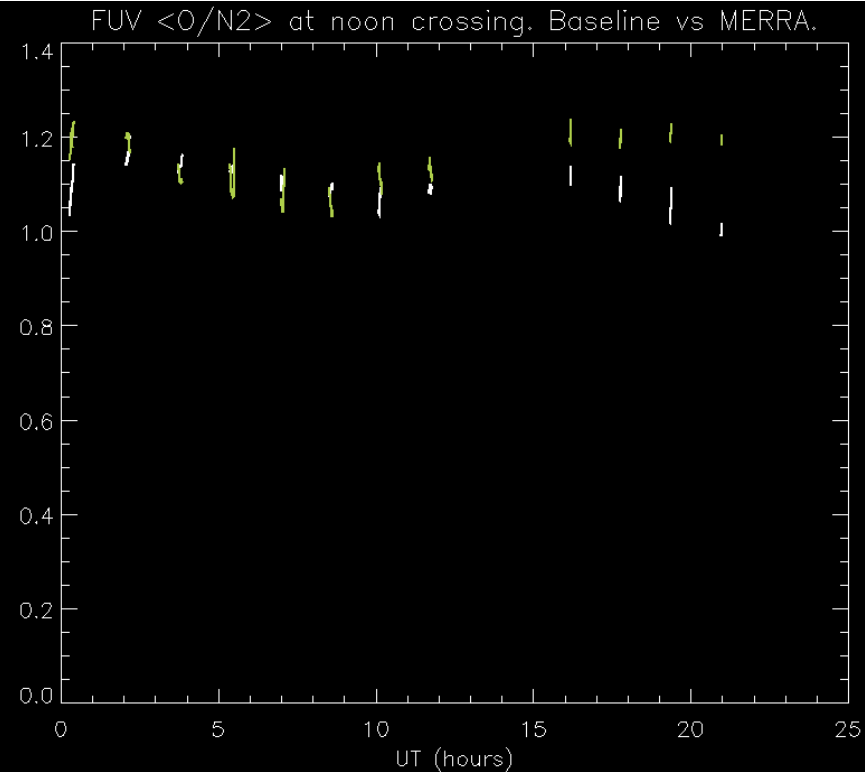


ICON Daytime O/N2 for a day

6-18 Local Time



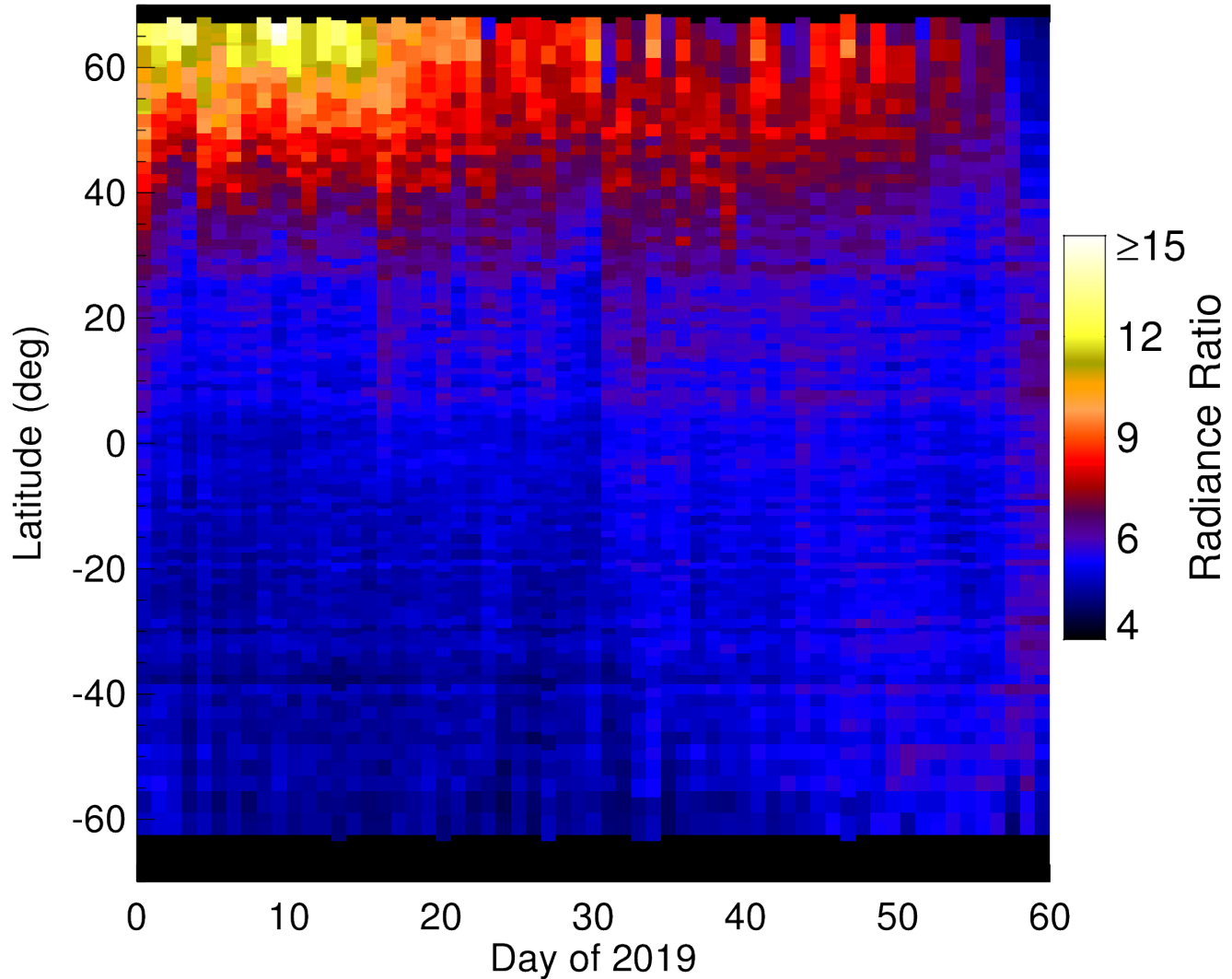
Noon Crossing



Focus on NOON CROSSING (right hand plot) of each orbit.
At 15 UT, the noon crossing of ICON is in the center of the GOLD image.

GOLD Noon Meridian @ 15 UT

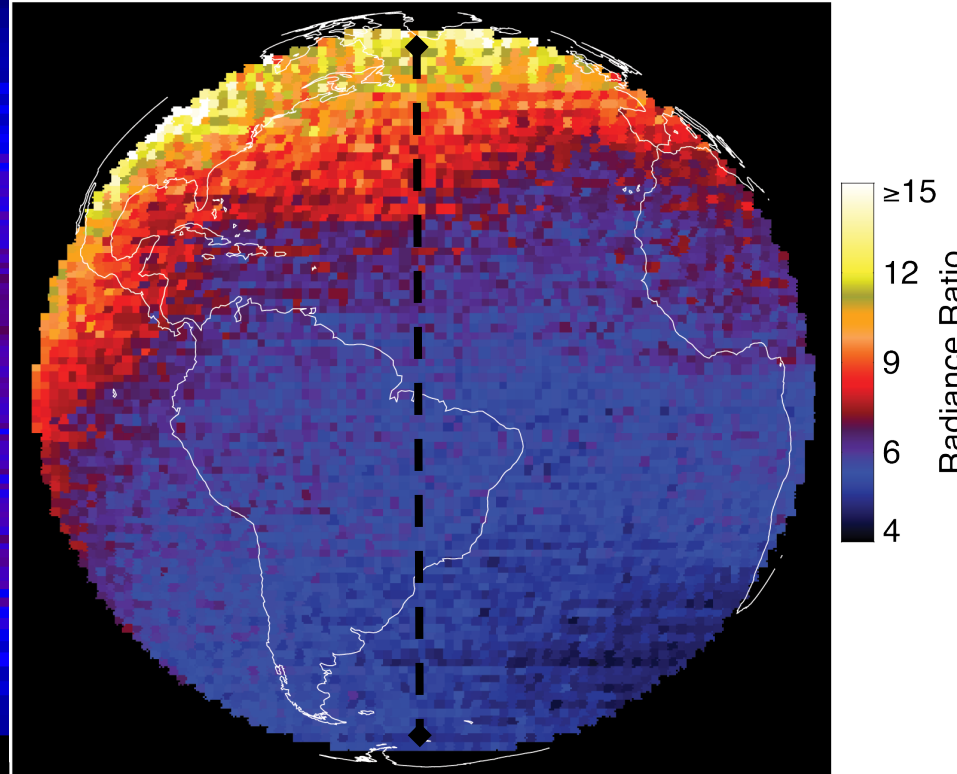
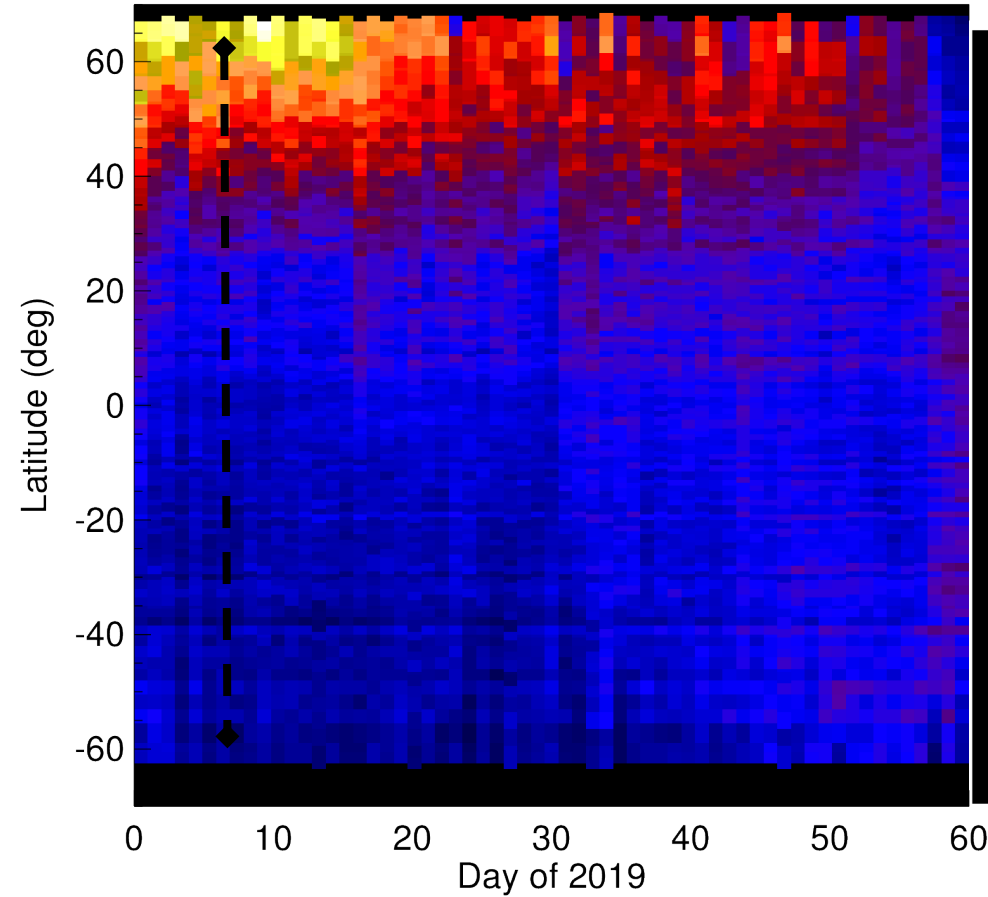
GOLD 135.6/LBH, 15 UT



GOLD Noon Meridian @ 15 UT - Detail

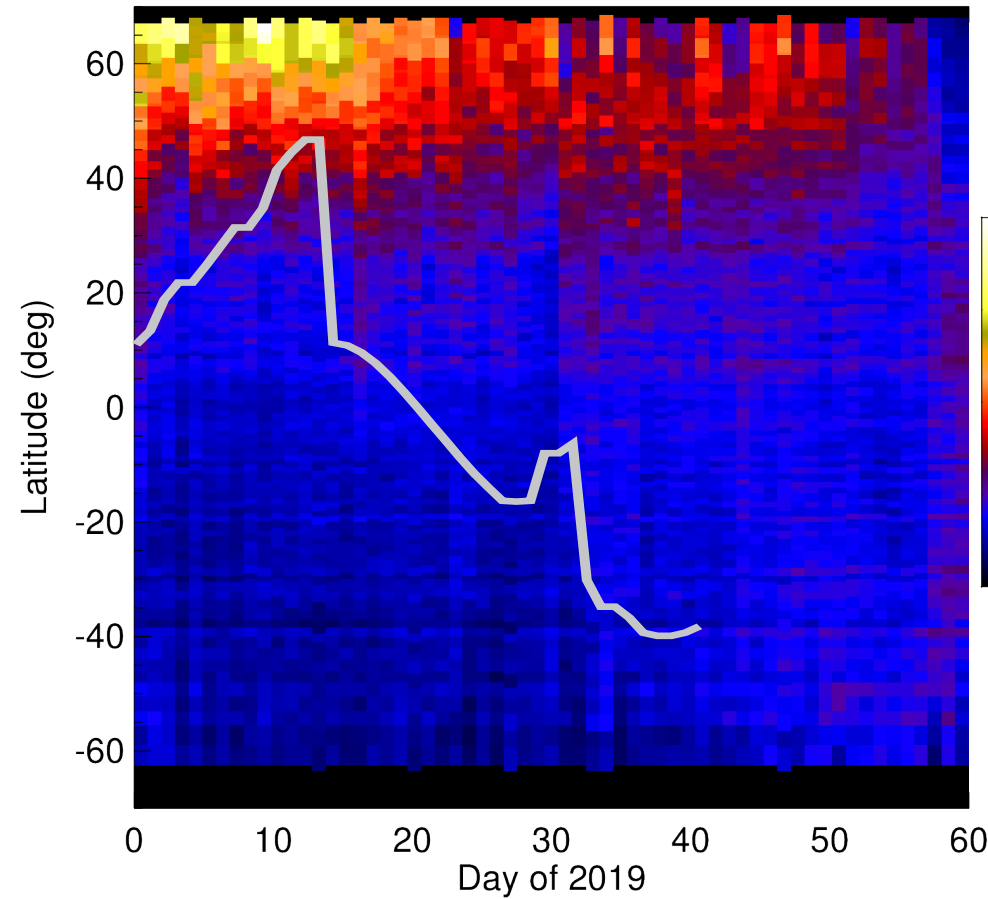
GOLD 135.6/LBH, 15 UT

GOLD 1356/LBH 2019, Day 007 (1/7), 14 UT

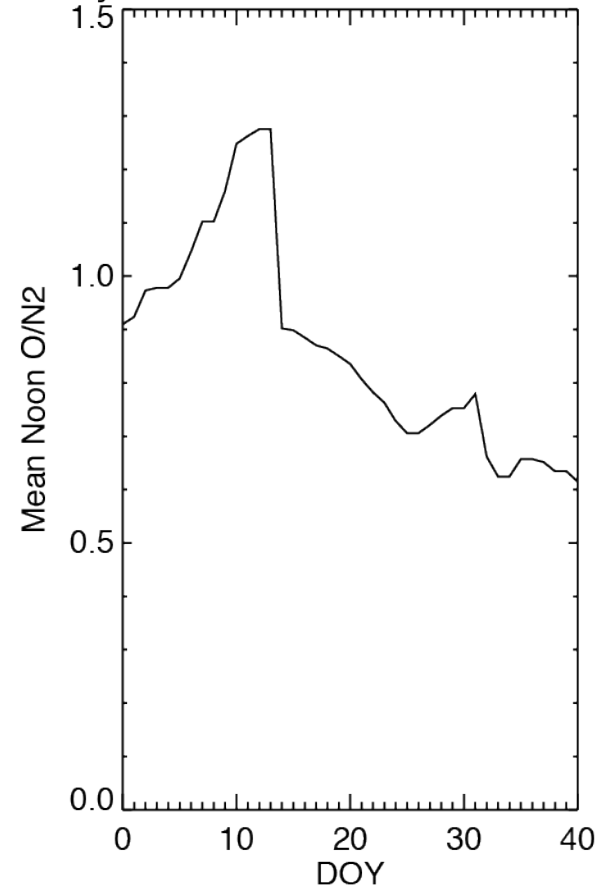


GOLD Noon Meridian with ICON Data

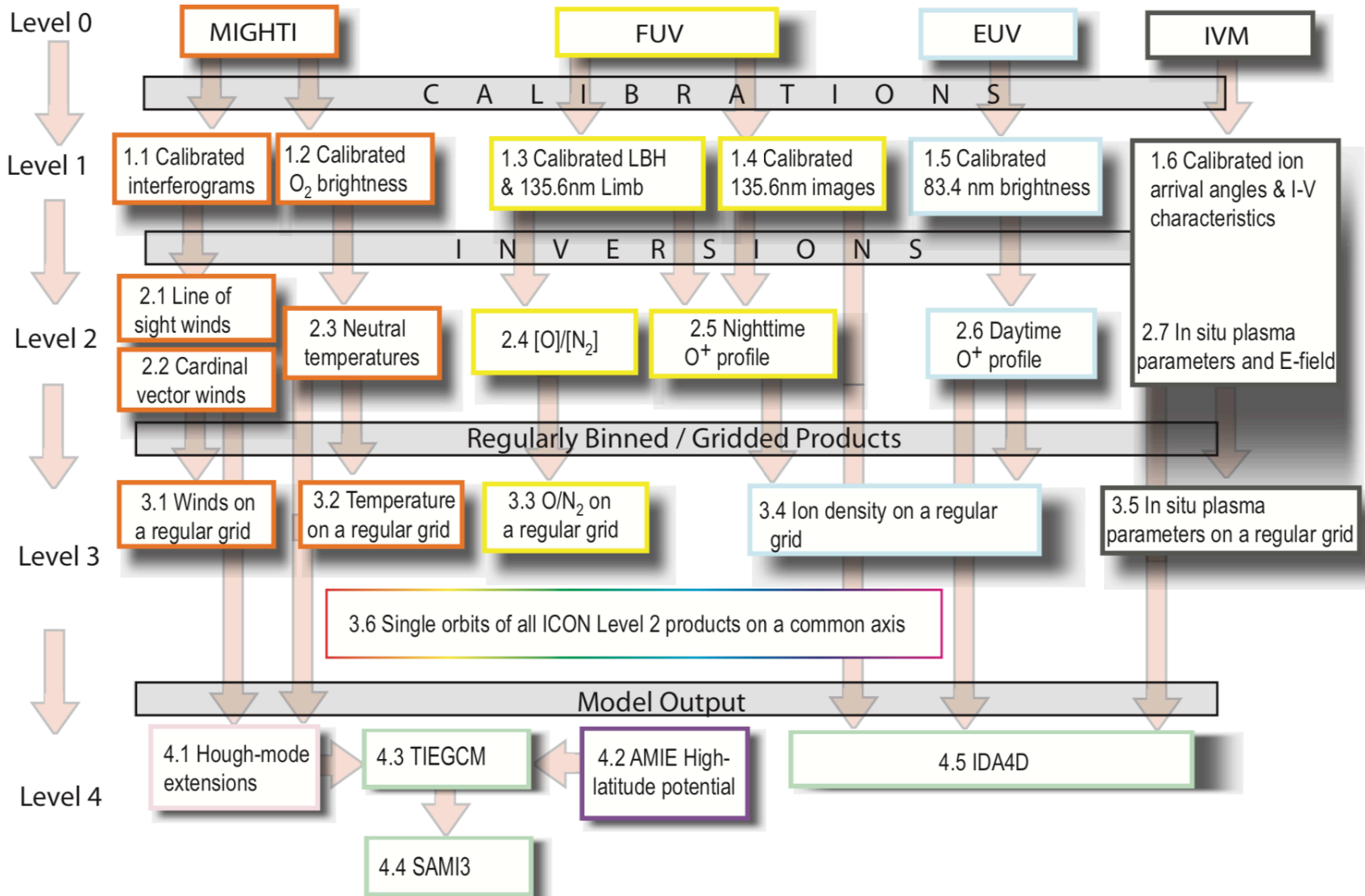
GOLD 135.6/LBH, 15 UT



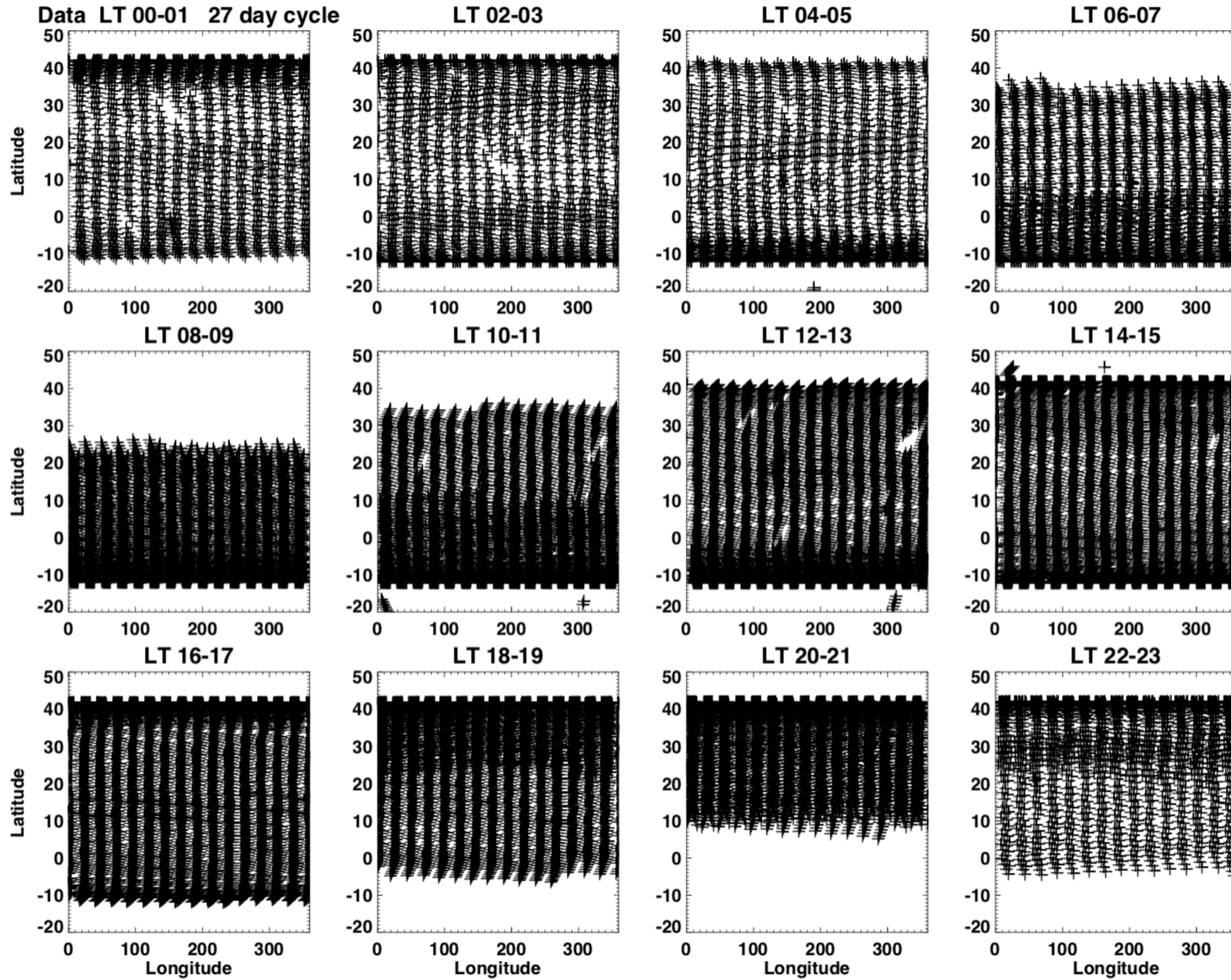
Daily Mean of Simulated Noon O/N2



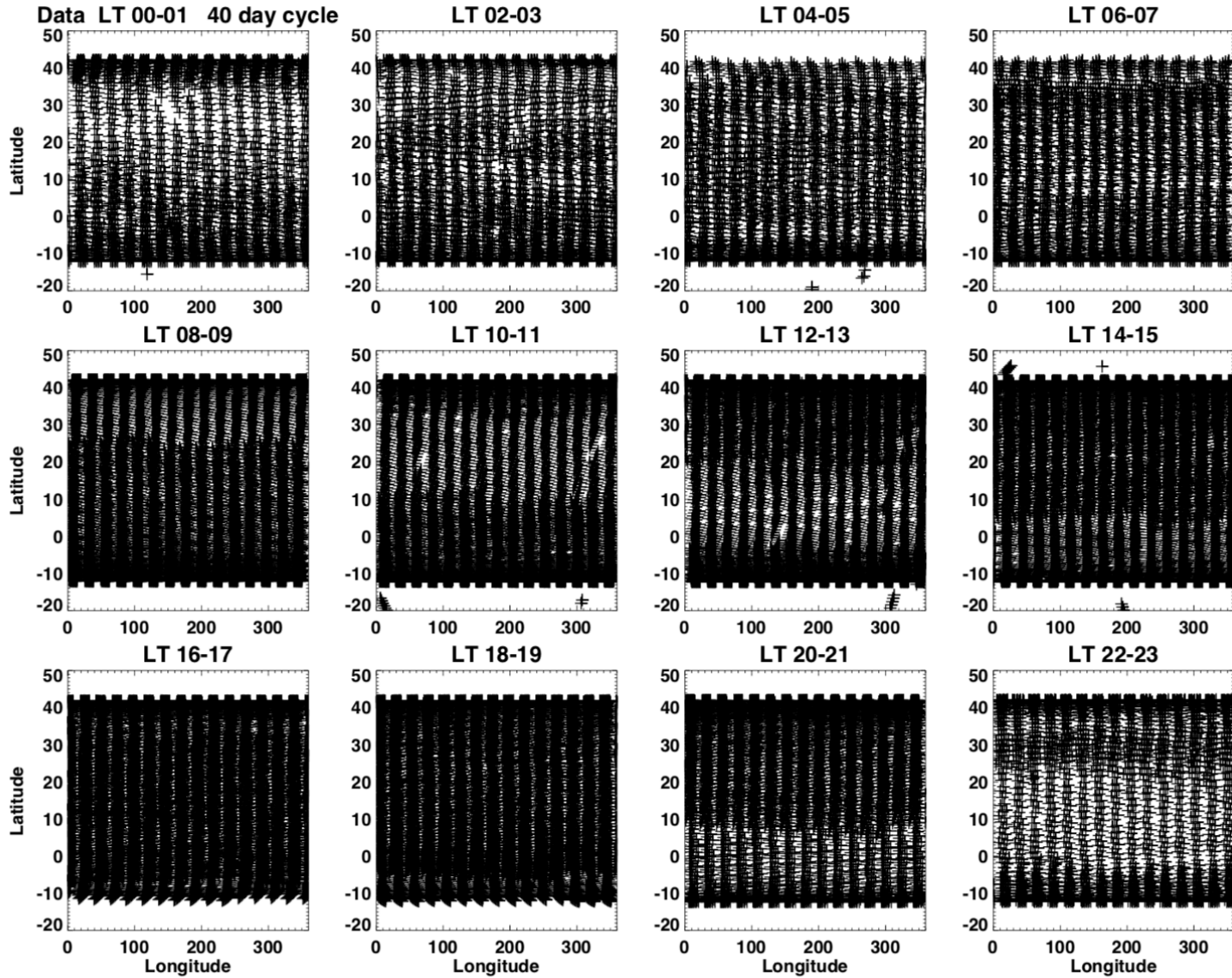
ICON Data Products, FYI



ICON Activity #3 – OSSE work to validate tidal retrievals completed.

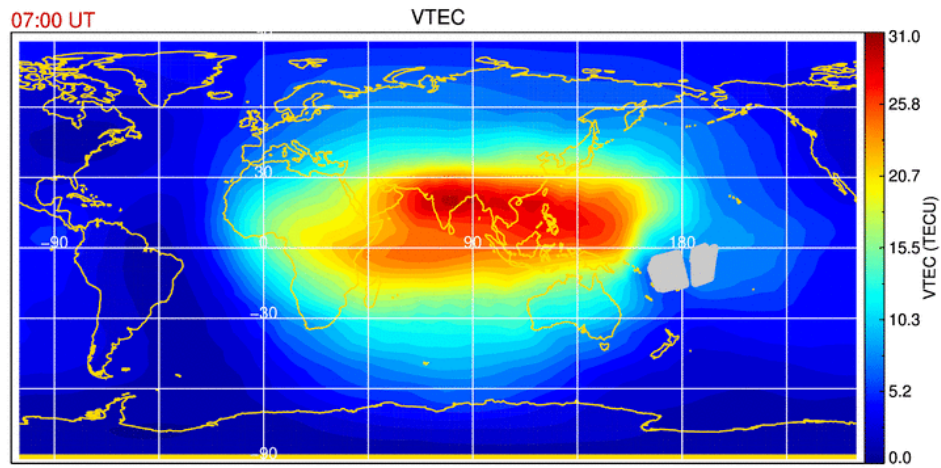
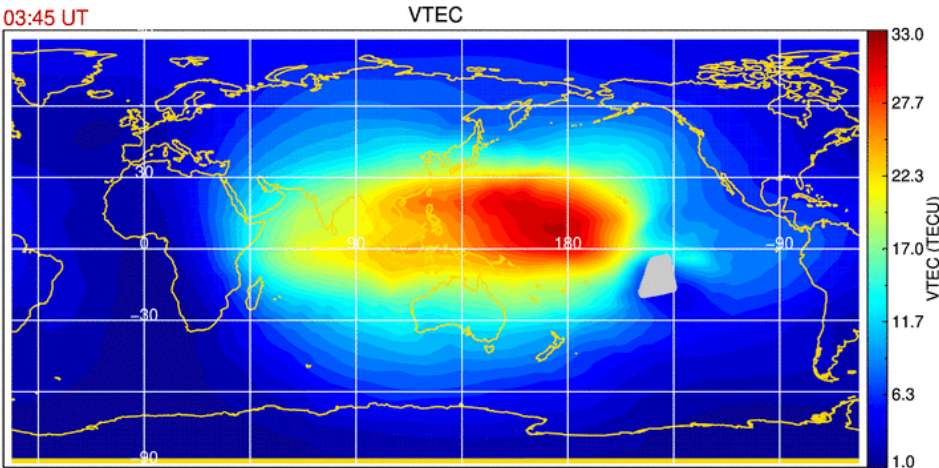
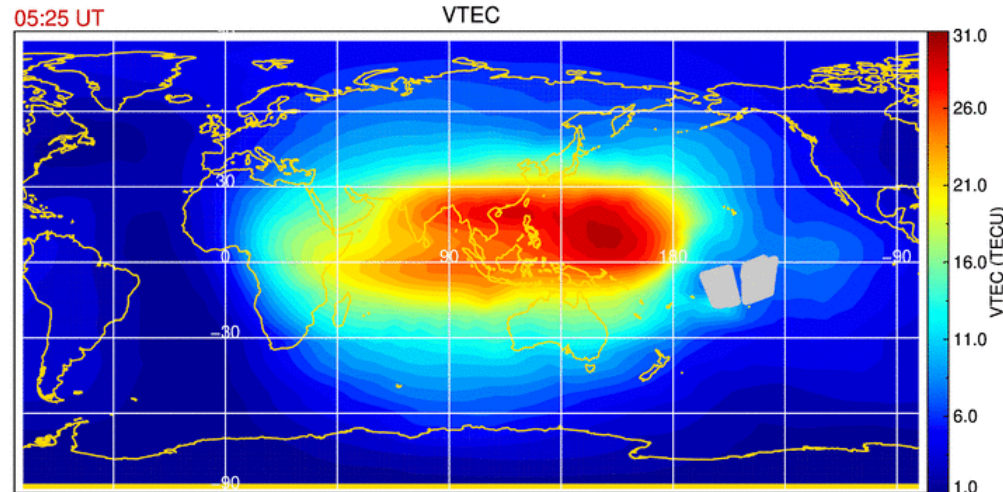


40-day Coverage Map for MIGHTI



ICON Activity #4 - IDA4D Assimilation

- ❑ IDA4D assimilates a number of ionospheric products including GPS RO and TEC measurements. New to IDA4D is ICON data.
- ❑ IDA4D initial state same as IRI
- ❑ IDA4D assimilates simulated nighttime Level 1 UV radiance observations by ICON FUV, originating from TIEGCM simulations and emission modeling.



Conclusions



- ❑ ICON Mission provides ionospheric and atmospheric data that are ready for assimilative models.
- ❑ ICON has revised and finalized its Level 2 data formats, moving to uniformity across all products in variable names and other file conventions.
- ❑ ICON will be ready to make comparisons to GOLD and other observatories, on-orbit and upcoming.
- ❑ ICON EUV and FUV ionospheric radiance and retrieval products are ready for ingestion into the ICON IDA4D model
- ❑ The ICON IDA4D product will assimilate these and other products for a valid instantaneous view of ionospheric densities.