



# GOES-U (FM4) Status

## GLM Science Team Meeting

*James (Jake) Heath*

*GLM Science Lead*

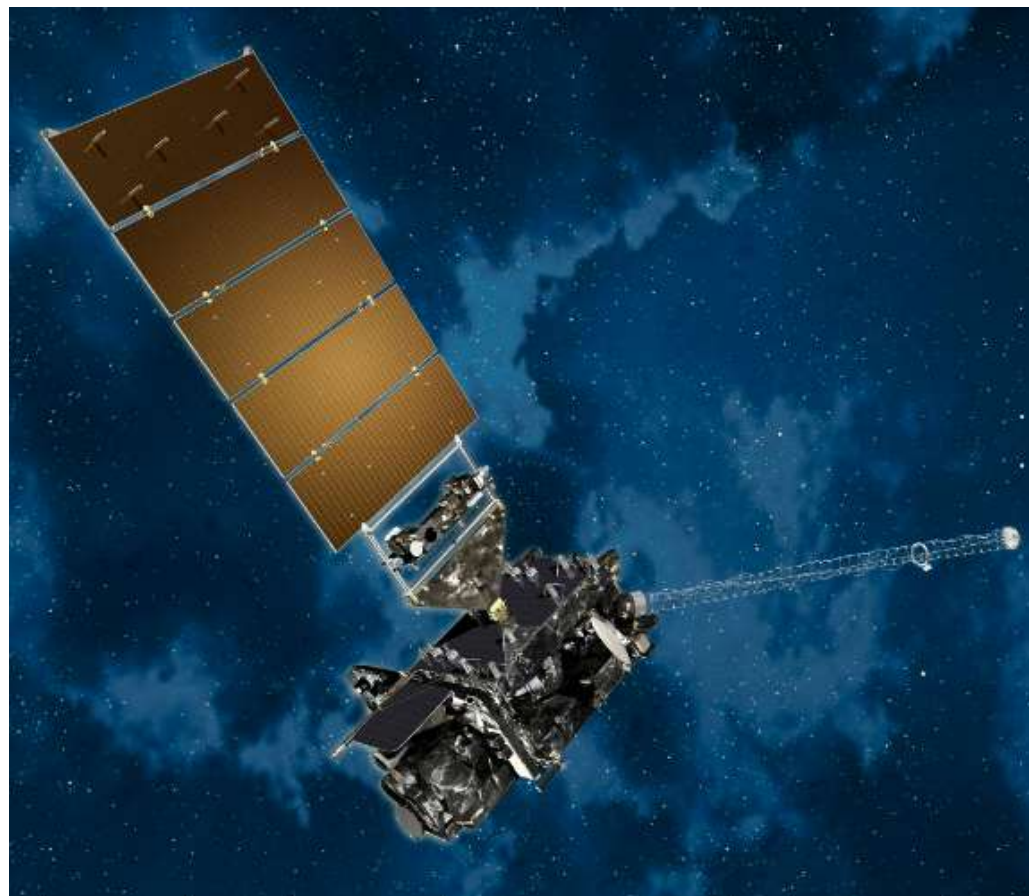
*11/8/2023*



# GOES-U Update Summary



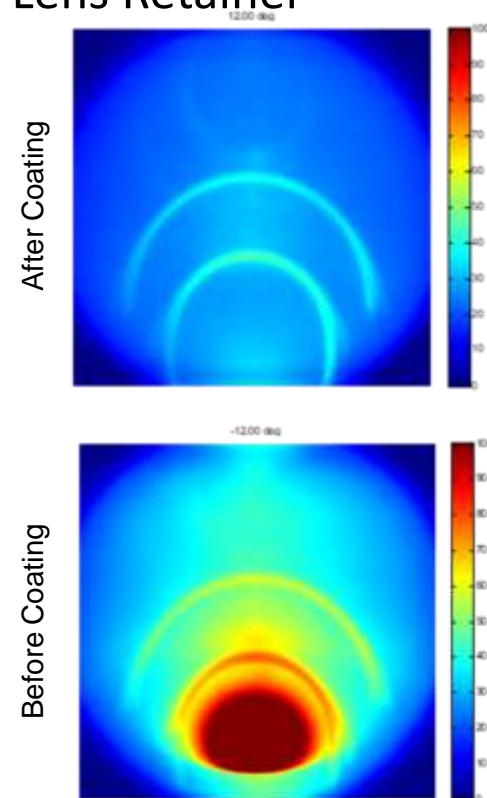
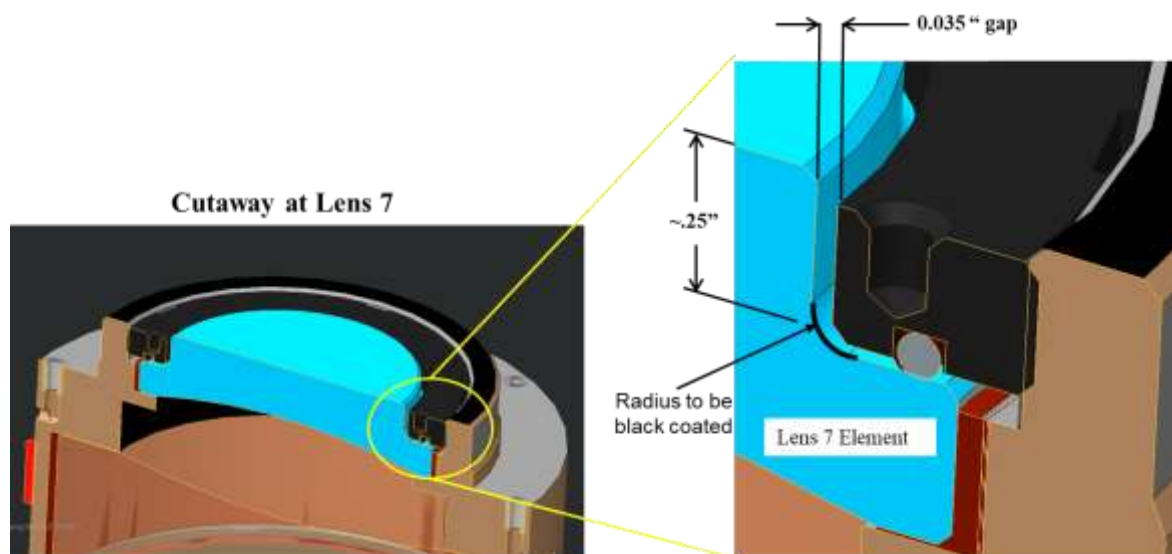
- GOES-U
  - Environmental testing was completed
  - PSR was passed
  - **Launch April 30th 2024**



# Stray Light Mitigation Design Change

Stray light mitigation applied black coating to inner radius of Lens element 7 to reduce internal reflection at edge of lens

Surface located at base of gap between lens element and Lens Retainer

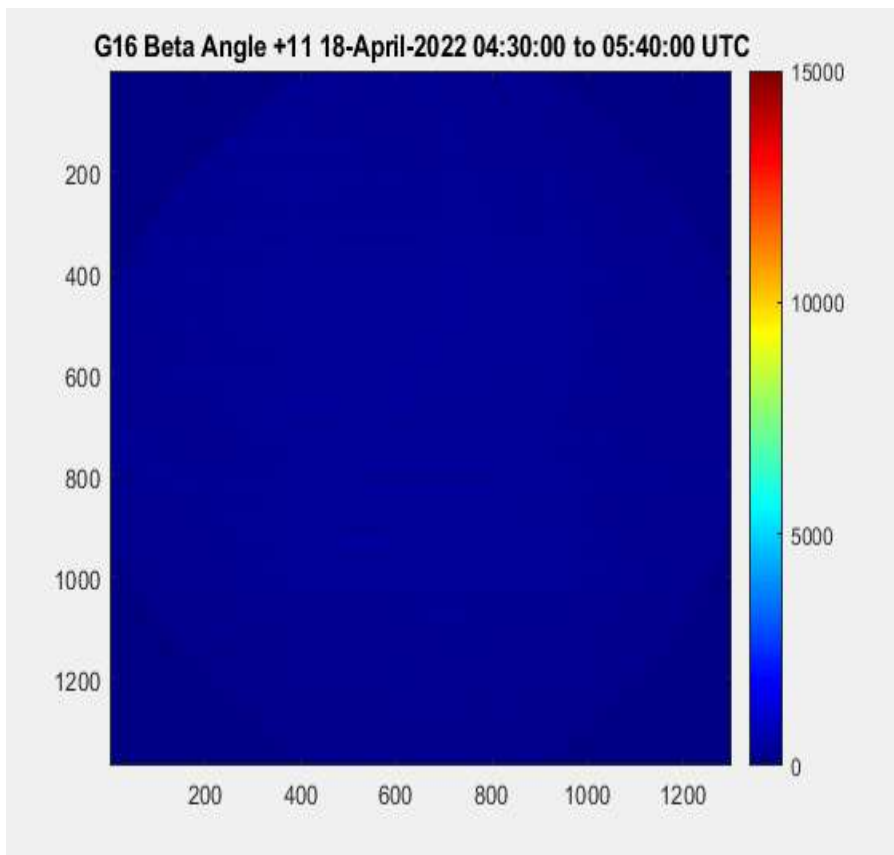




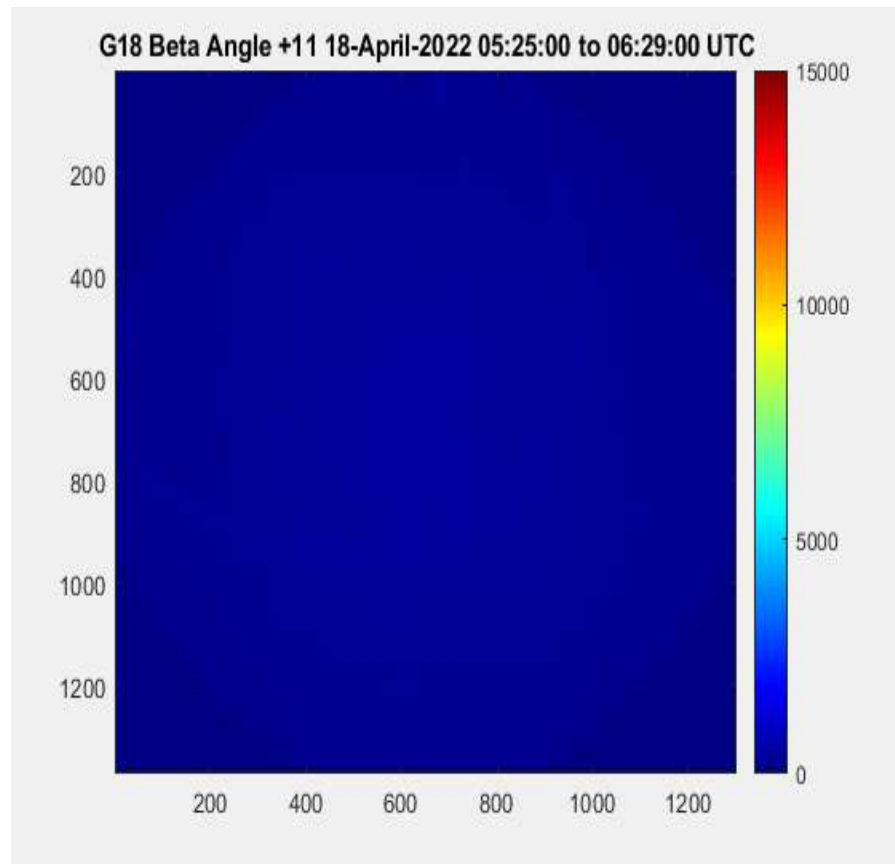
# Solar intrusion: Beta Angle +11 18-April-2022



GOES-16



GOES-18 (expected for GOES-19)





# Gain and Overshoot Design Change

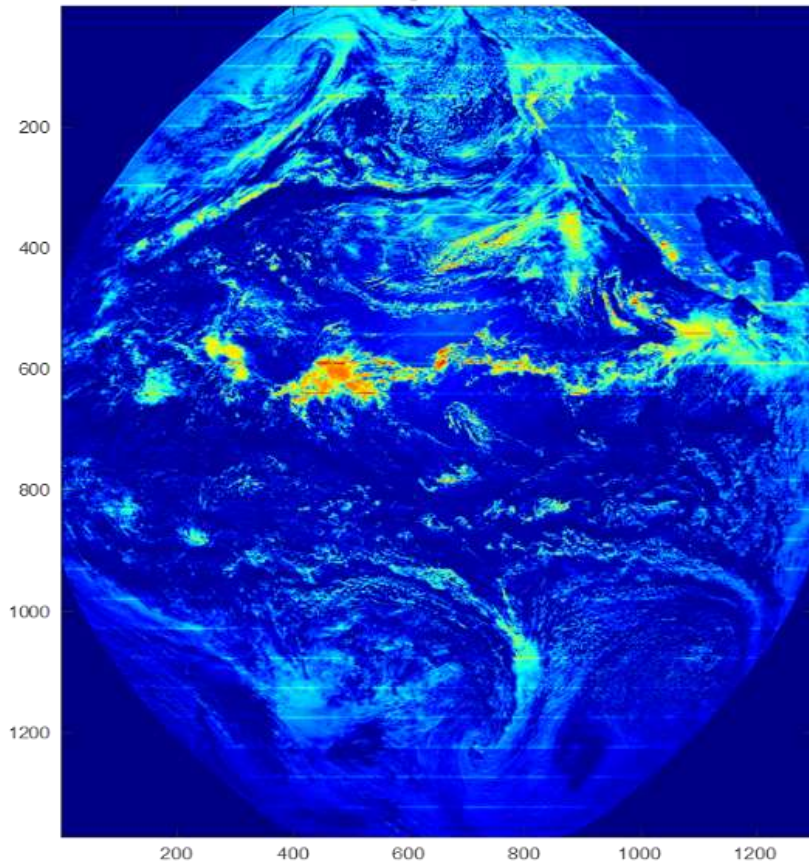


- FM1/2 experiences saturated pixels at brightest background illumination
  - Higher than expected gain (DN per  $\mu\text{J}/\text{sr}\cdot\text{m}^2$ )
  - Overshoot at high contrast boundaries
  - “First Pixel” Overshoot
- Design modifications implemented on GOES-U
  - Changed component values in video electronics to reduce gain
  - Changed CCD bias voltages to reduce overshoot
    - Unexpected impact on linearity
    - Not as severe as reported at last year’s meeting

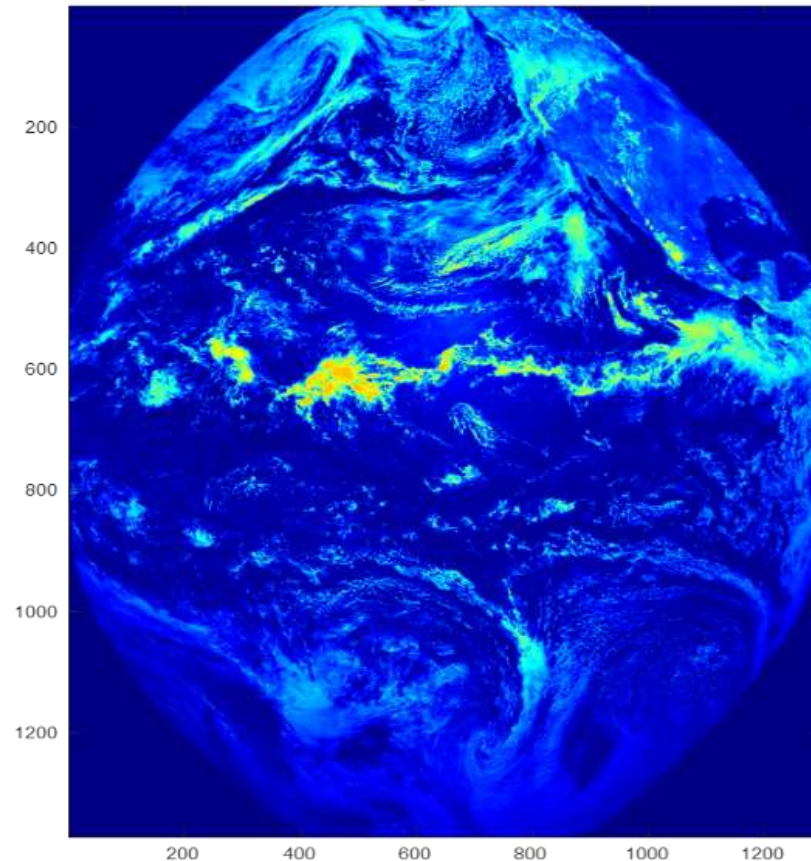
# Design Change Results

## Reduced Overshoot

G17 Dark-subtracted Image on 2022-12-06 21:01:47 UTC



G18 Dark-subtracted Image on 2022-12-06 21:01:00 UTC



GOES-17 vs GOES-18 (GOES-19 expectation) overshoot comparison



# Future GLM Instrument Performance



- GOES-U has lower threshold values and reduced overshoot/undershoot:
  - Better dynamic range under high illumination from lower thresholds
  - Consistently better DE at night
- On-orbit data showed depending on the FOV location, you get a 10-40% decrease in intensity during solar intrusion
- We expect similar on-orbit results to that of GOES-18

GOES-U is calibrated for optimal performance.