



# Regulation and NGSO Constellations Spectrum Monitoring

V1.0, ITU Space Sustainability Forum,  
Riyadh, 2026.10.13

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# Kratos: A Leader in RF Monitoring

## Leadership



Leading supplier of RF monitoring capabilities for:

- satellite operators
- armed forces and
- regulators

## Solutions



Provide turnkey solutions based on integrated COTS products for every monitoring mission

NGSO monitoring COTS development in collaboration with Groundspace

## Experience



Extensive history providing monitoring stations to frequency regulators:

- BNA Germany
- UCRF Ukraine
- TRA Oman
- ANATEL Brazil
- CRA Qatar
- MIC Japan
- FCC United States
- OFCOM UK

## Network

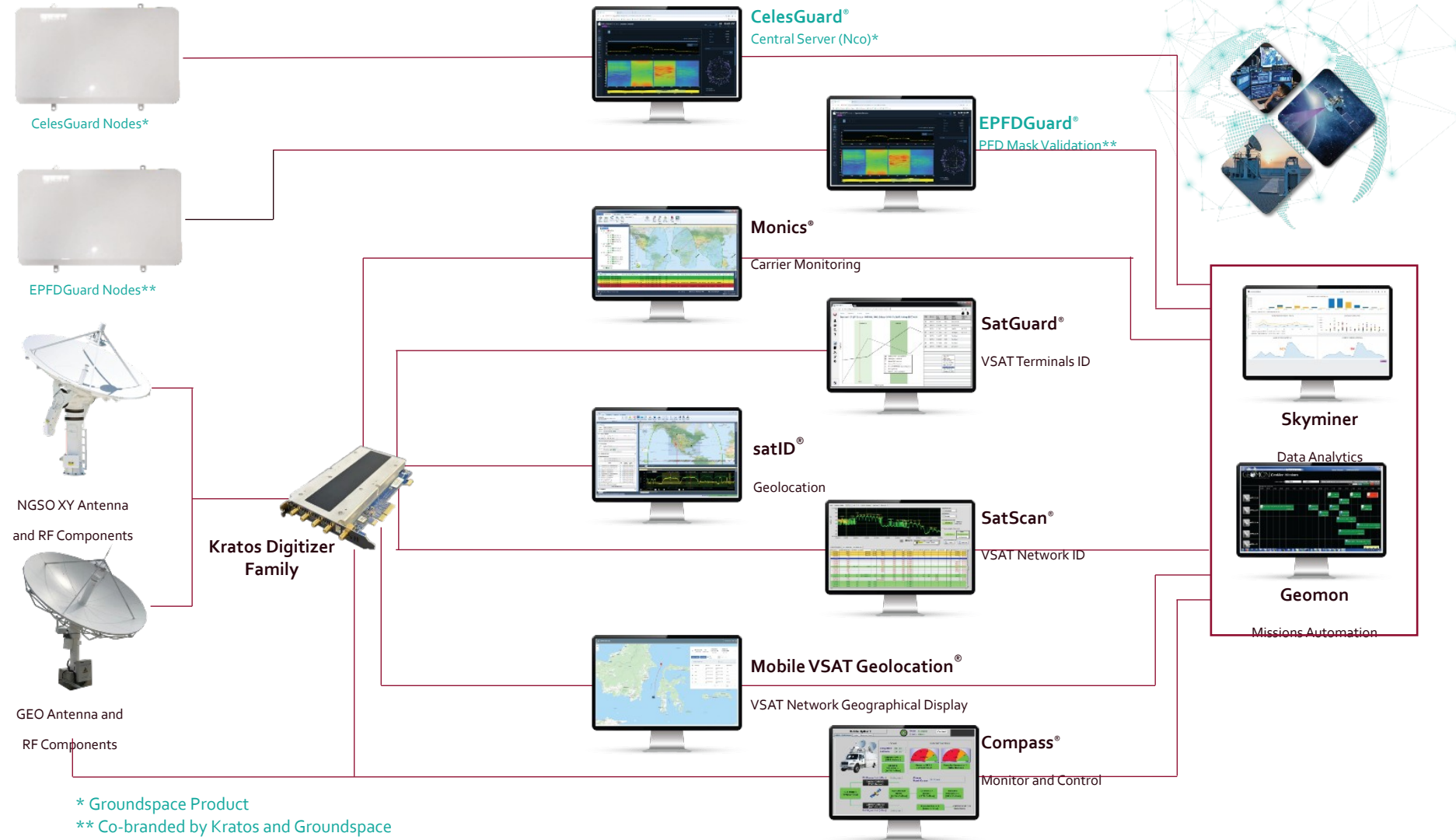


Provide RF monitoring related services through the Kratos Known Space Network (KSN)



# Kratos: Integrated Architecture

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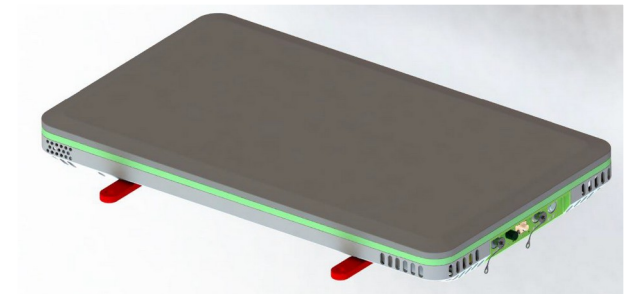


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# NGSO Monitoring – CelesGuard

- Electronically Steerable antenna and digitizer node
- Each Node scan all visible satellites In full Ku-Band or full Ka-Band
- One Node local processing
  - Confirmed List of detected channels
  - Confirmed List of transmitting satellites
  - Spectrum measurements:
    - Channel Center Frequency
    - Channel Bandwidth
    - Spectrogram
- Information sent back to central site
- Current: Starlink (US), OneWeb (FR), O3b/mPOWER (LUX), Qianfan (China)
- Future: Amazon LEO (US), Rassvet (Russia) and more



# Monitoring NGSO constellations Spectrum

## Use Cases



# NGSO Monitoring – Use Cases

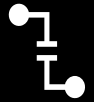
## Use Cases

## Monitoring



Frequency coordination and detection of interferences

Interference between NGSO constellations and GEO satellites may occur and lead to intermittent interruption of service for some users.



Detect unauthorised transmissions

NGSO satellites may not be licenced to operate in certain regions or may transmit unexpected signals or may transmit within the geo arc exclusion zone.



Evaluate Constellation impact on GEO services

Confirm actual constellation impact on GEO services and collect data in preparation of future regulation discussions (WRC and/or ITU meetings).



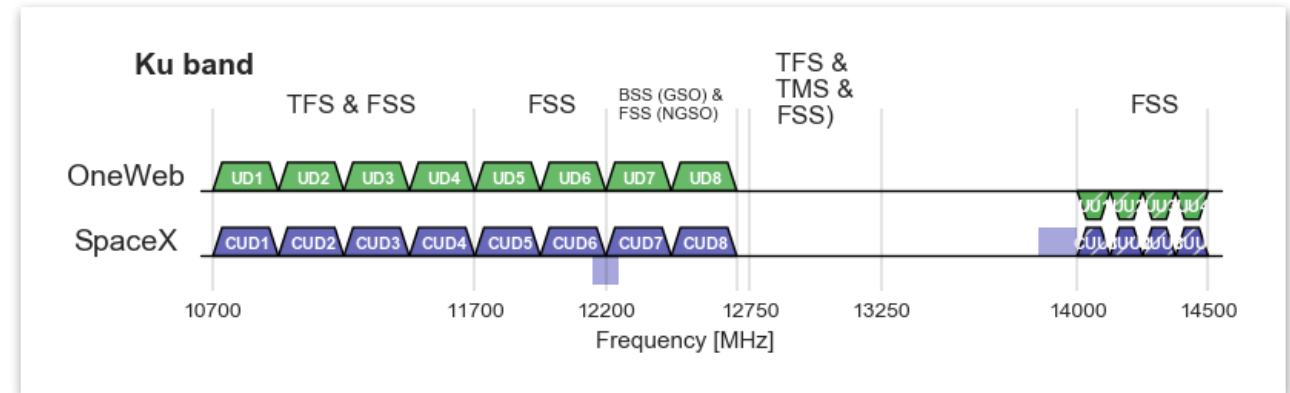
# NGSO Constellations



# NGSO Constellations (As of August 2026)

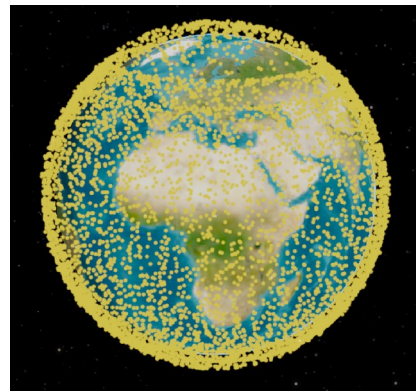
- Starlink, OneWeb and Qianfan use the same Ku-Band user channels

- From 10.7 to 12.7 GHz downlink
- From 14 to 14.5 GHz uplink

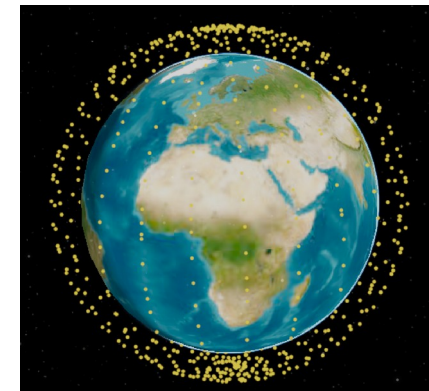


- Current Counts in Orbit / Planned:

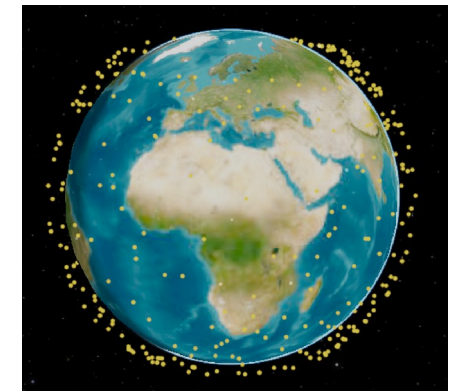
- Starlink: **11,154** / 12,000
- OneWeb: 651 / 648
- kuiper: 391 / 3,236
- Qianfan: 257 / **14,000**
- Guowang: 168 / **13,000**
- Rassvet: 31 / 900



Starlink



OneWeb



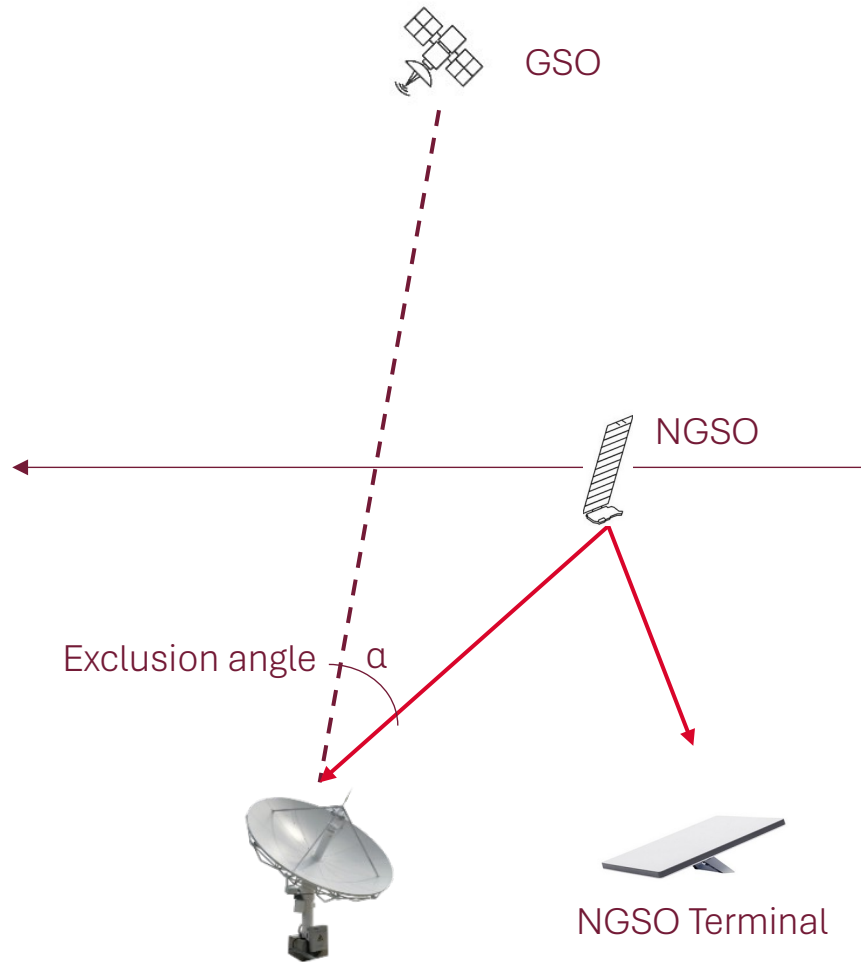
Kuiper



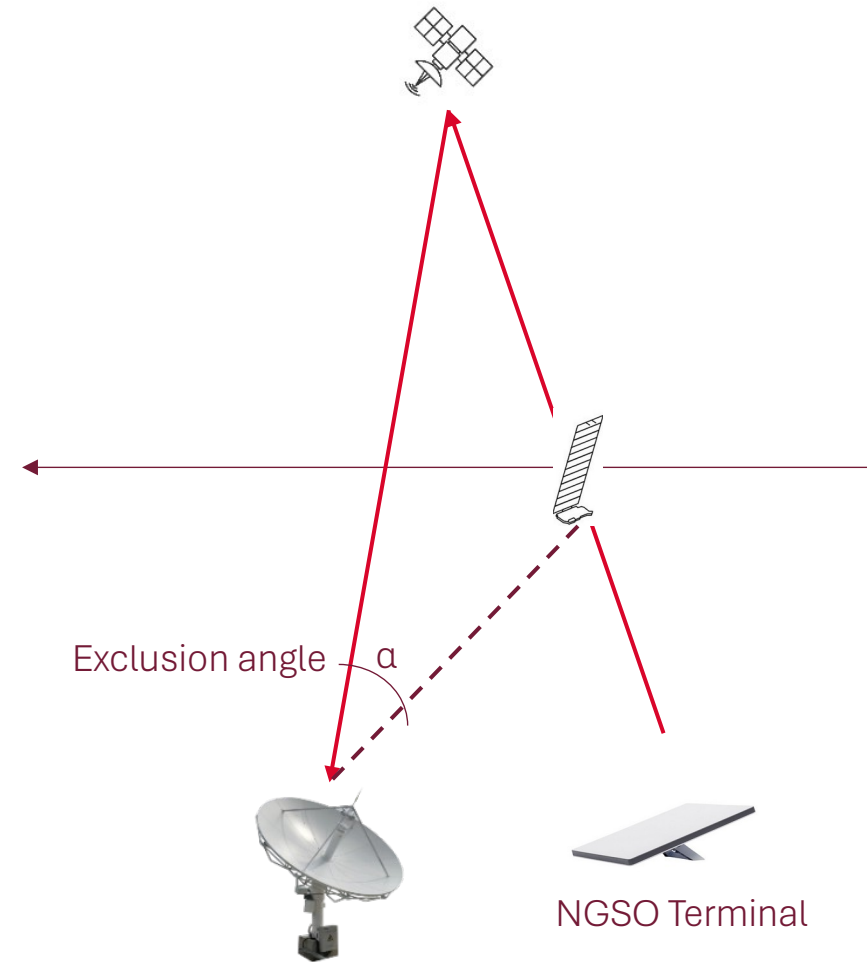
# NGSO / GSO Coordination



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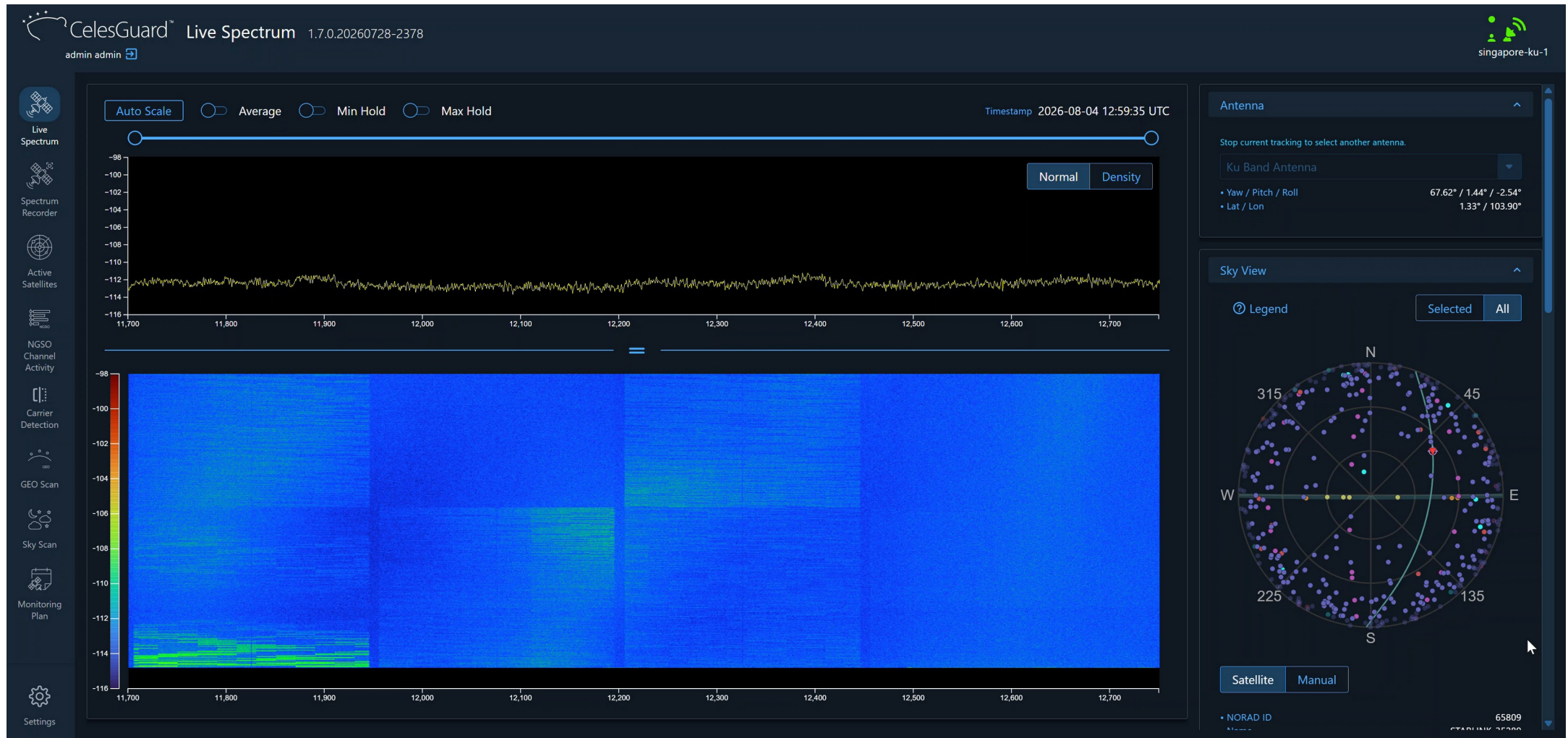
Downlink Interference



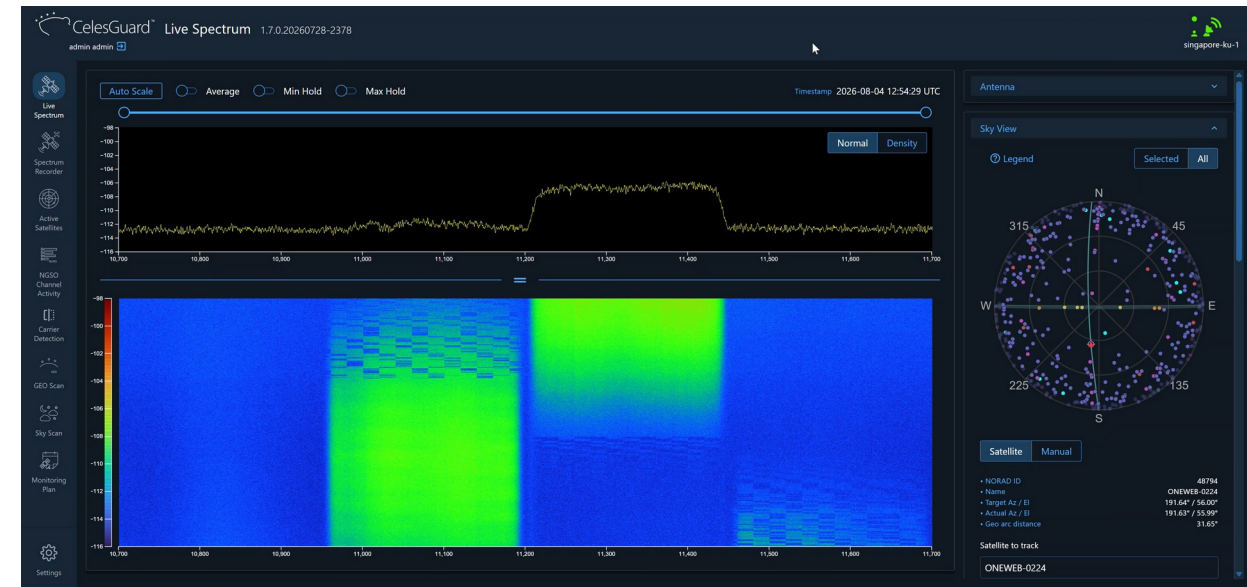
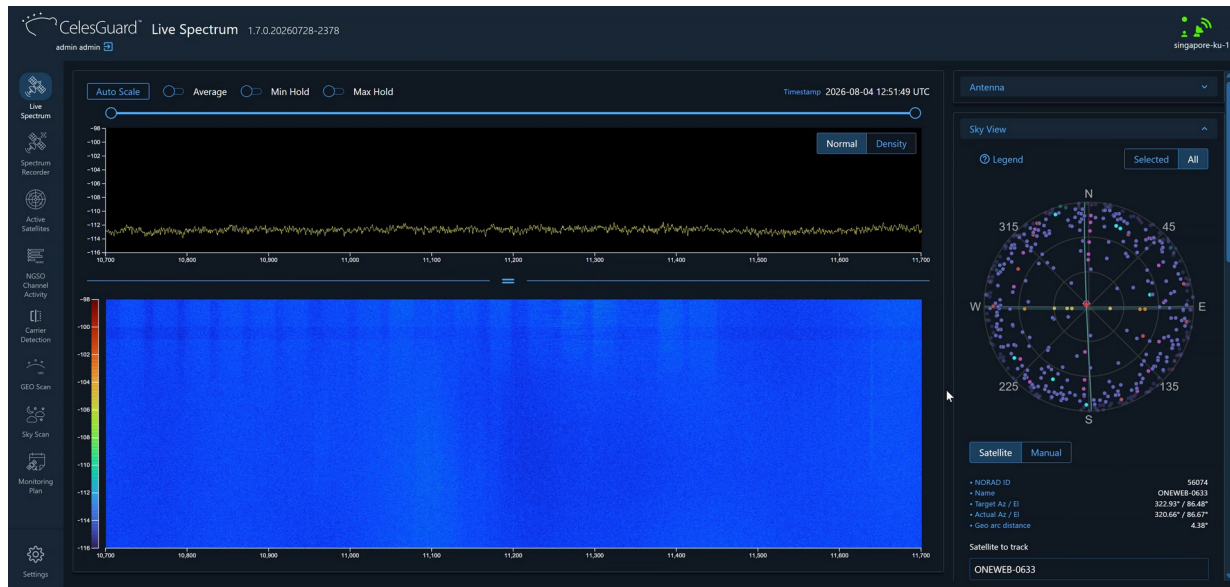
Uplink Interference



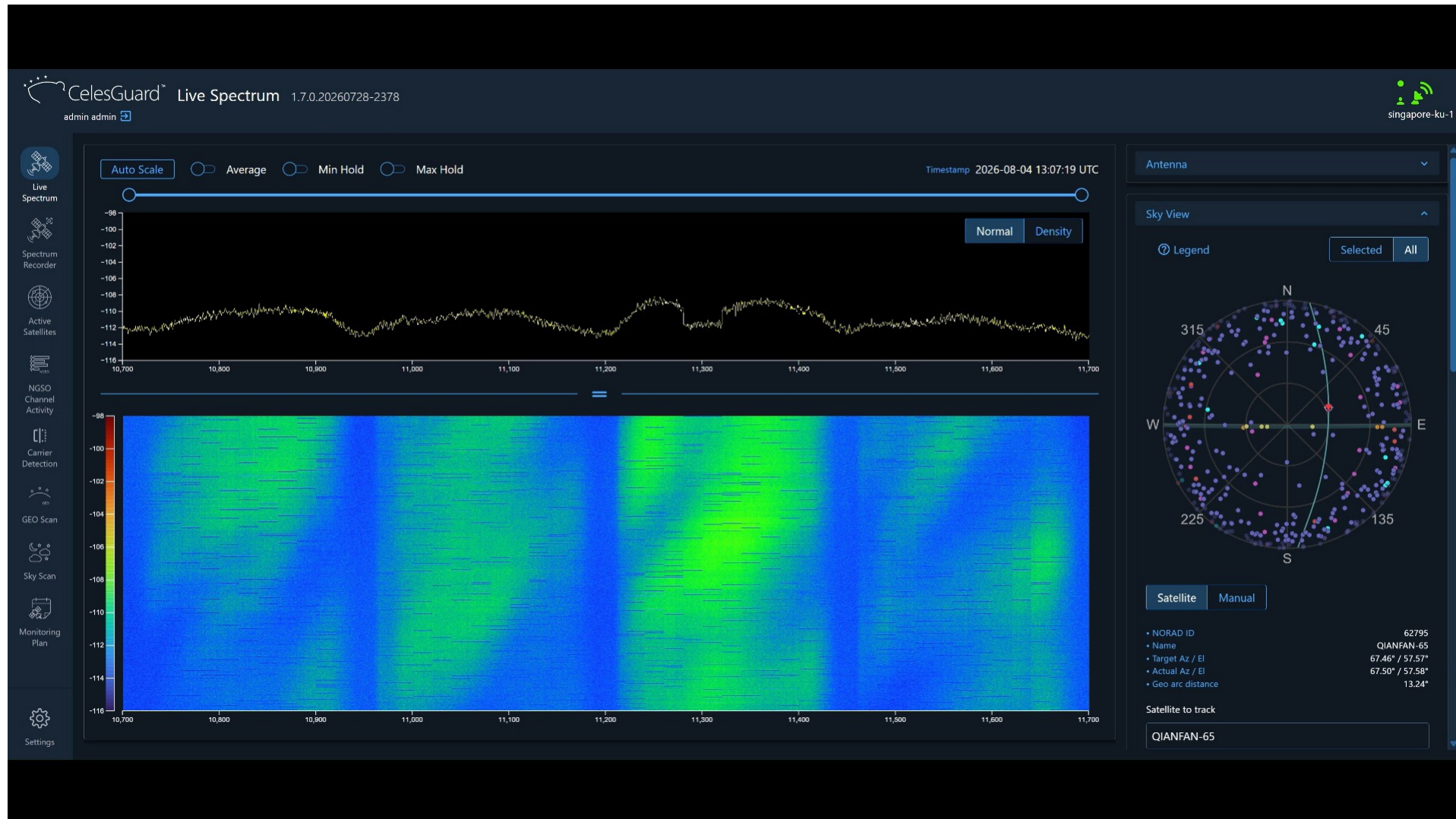
# NGSO / GSO Coordination - Starlink



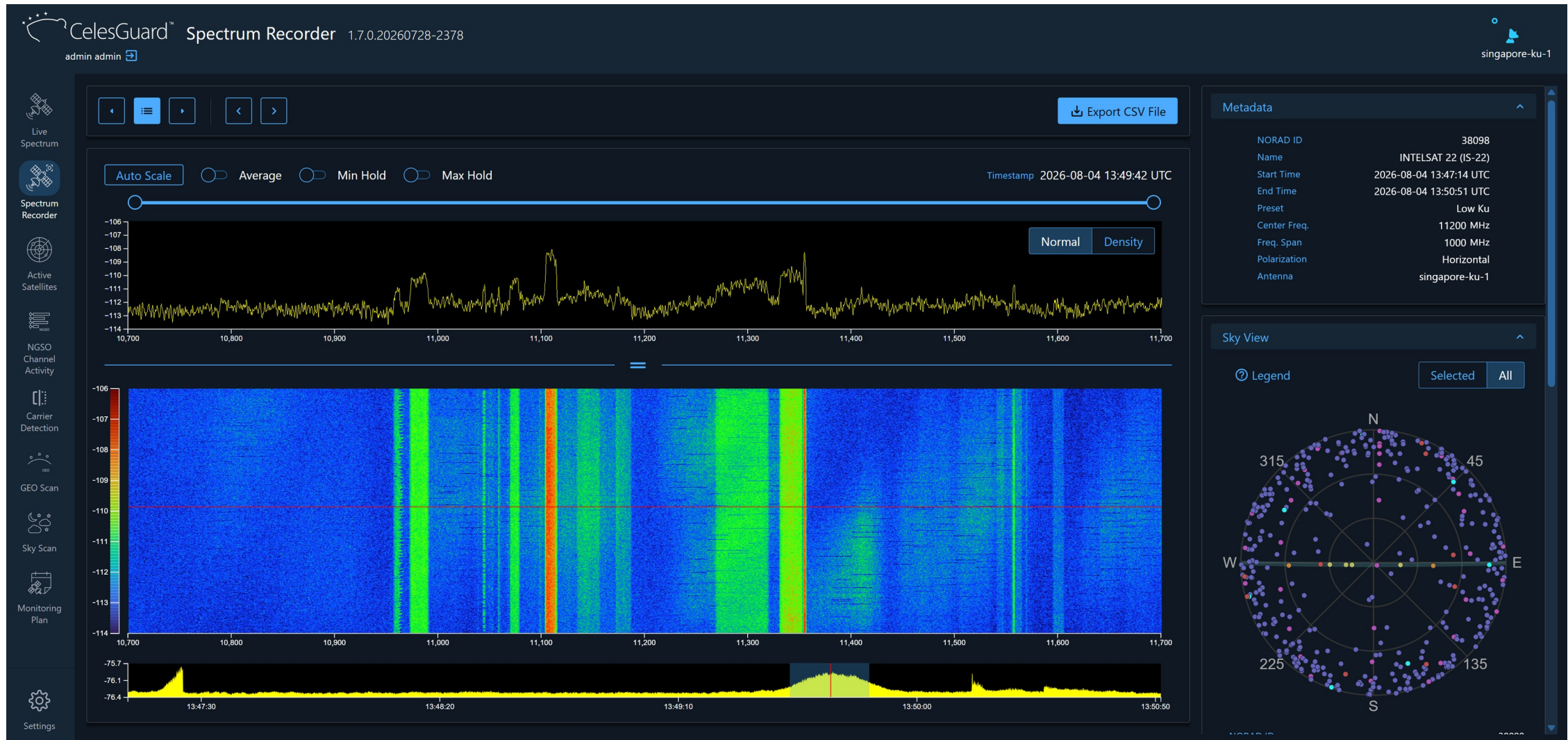
# NGSO / GSO Coordination - OneWeb



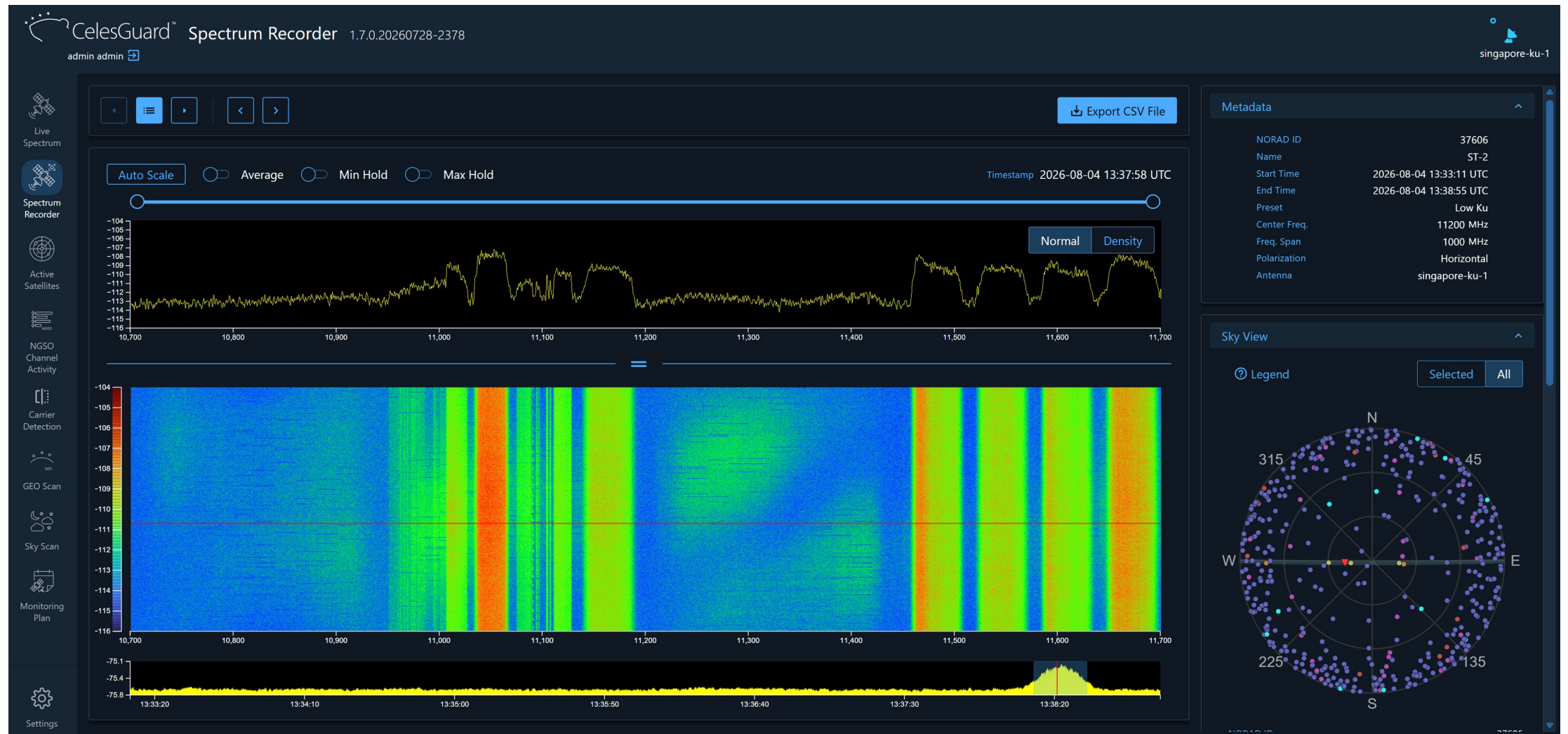
# NGSO / GSO Coordination - Qianfan



# NGSO / GSO Coordination – Qianfan / INTELSAT 22



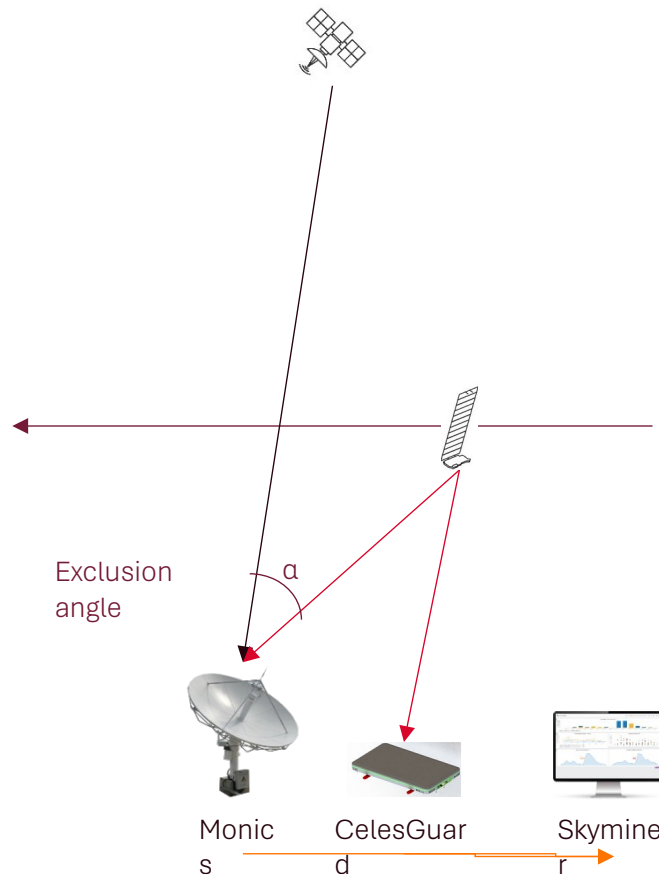
# NGSO / GSO Coordination – Qianfan / ST2



# Conclusion



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- New FCC rules (FCC 26-26), voted April 30, 2026
  - replaces the Equivalent Power Flux Density (EPFD) framework
  - “improved spectrum sharing possibilities that modern satellite technology has brought, including through use of adaptive coding and modulation (ACM). ”
  - “good-faith coordination to allow NGSO and GSO operators to bargain for appropriate interference protections through voluntary, private agreements.”
- May work in US when INTELSAT must talk with SPACEX
- What about other regional GEO operators?
- What about other NGSO constellations?
- Monitoring NGSO constellations more important then ever
  - Detect interferences and service degradation caused by NGSO
  - Get ready for discussions with NGSO operators
  - And get ready for next ITU discussions (Study Groups and WRC)





# Contact Us

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