



Monitoring NGSO Constellations

V1.0, ISRMM27

Bucharest, Romania, 2026.09.01

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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
- Brazil Anatel
- CRA Qatar
- MIC Japan
- US FCC
- UK Ofcom

Network

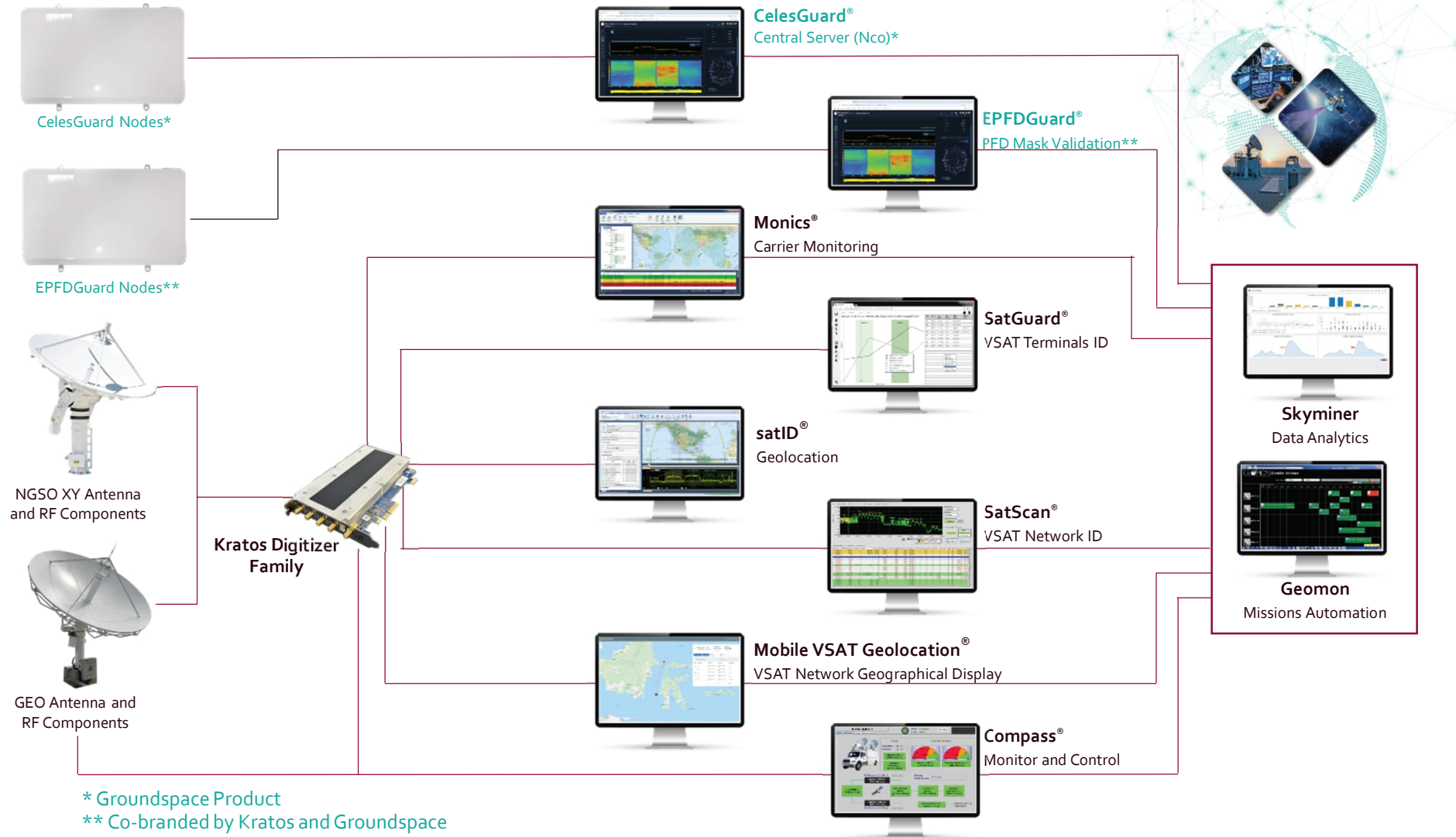


Provide RF monitoring related services through the Kratos Global Service Network (KGSN)



Kratos: Integrated Architecture

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Monitoring NGSO constellations

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 in preparation of future regulation discussions (WRC and/or ITU meetings).



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), Sfera (Russia) and more



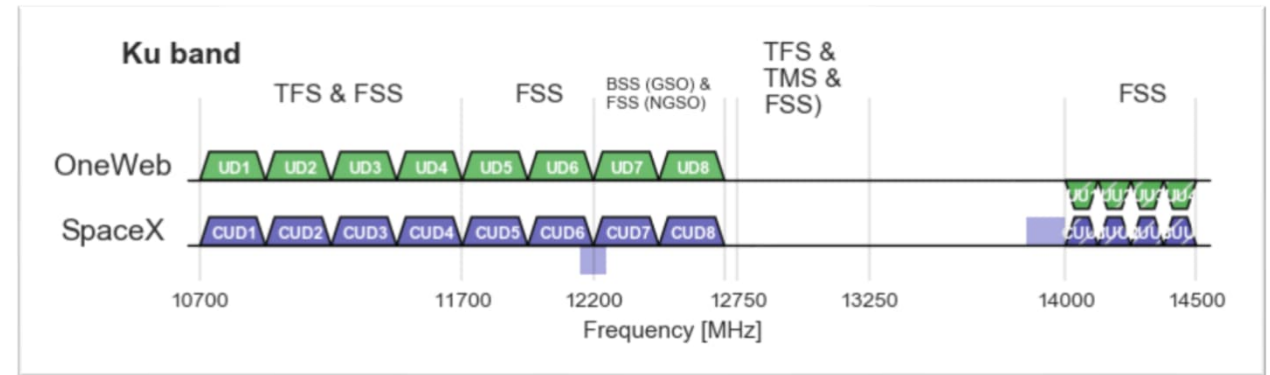
NGSO Constellations



NGSO Constellations

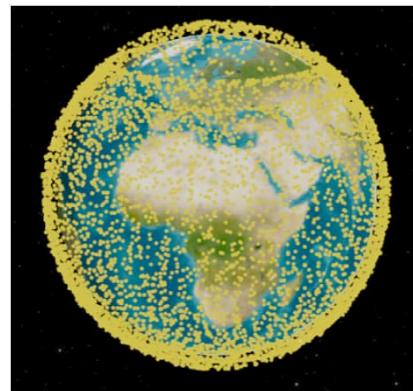
- Starlink, OneWeb and Qianfan use the same user channels

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

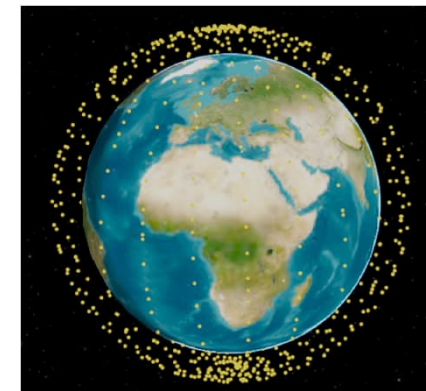


- Current Counts in Orbit / Planned:

- Starlink: 9,731 / 12,000
- OneWeb: 649 / 648
- kuiper: 392 / 3,236
- Qianfan: 238 / 14,000
- Guowang: 168 / 13,000



Starlink



OneWeb



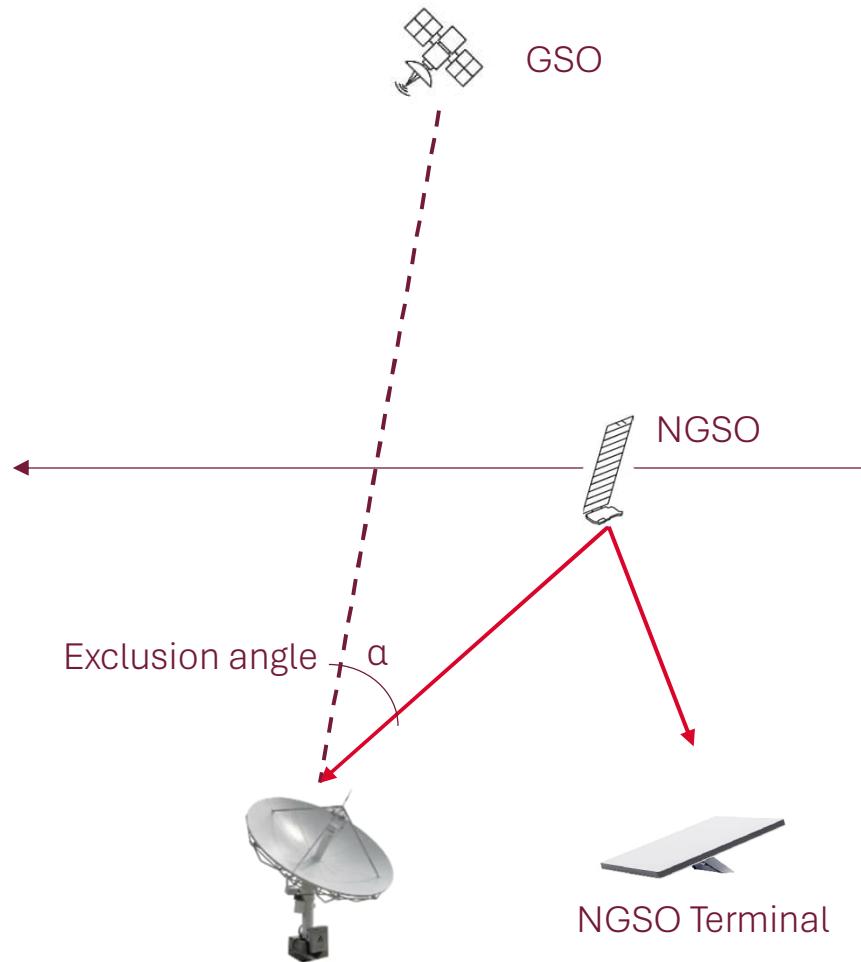
Kuiper



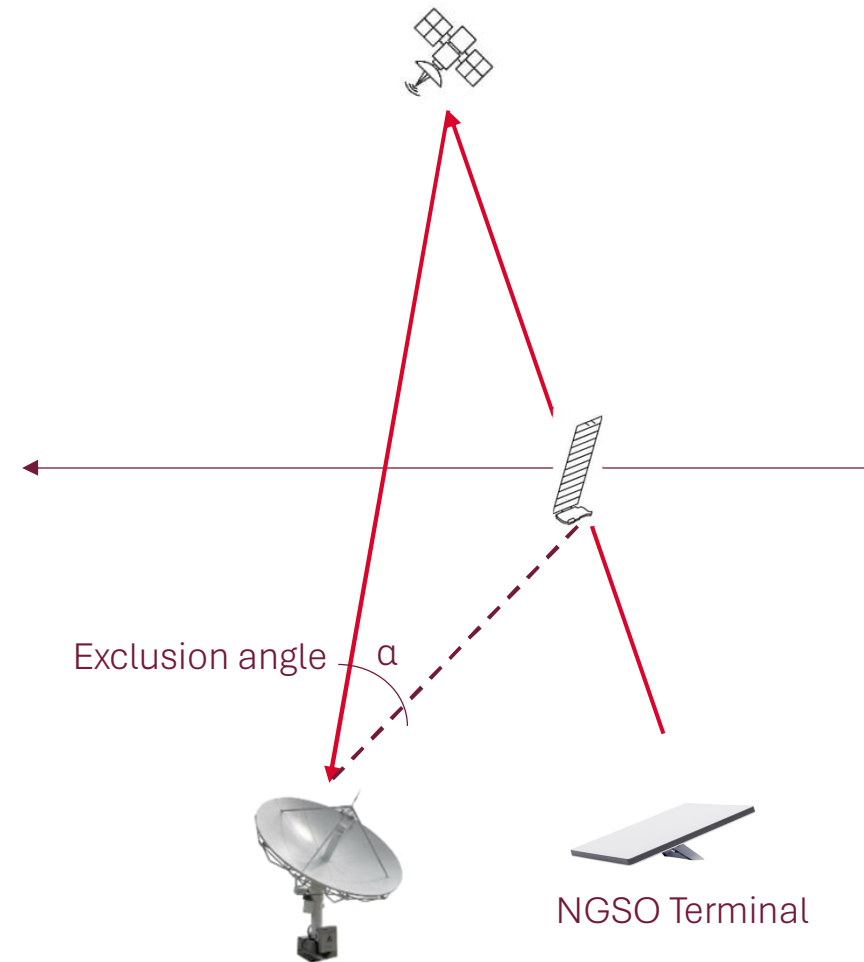
NGSO / GSO Coordination



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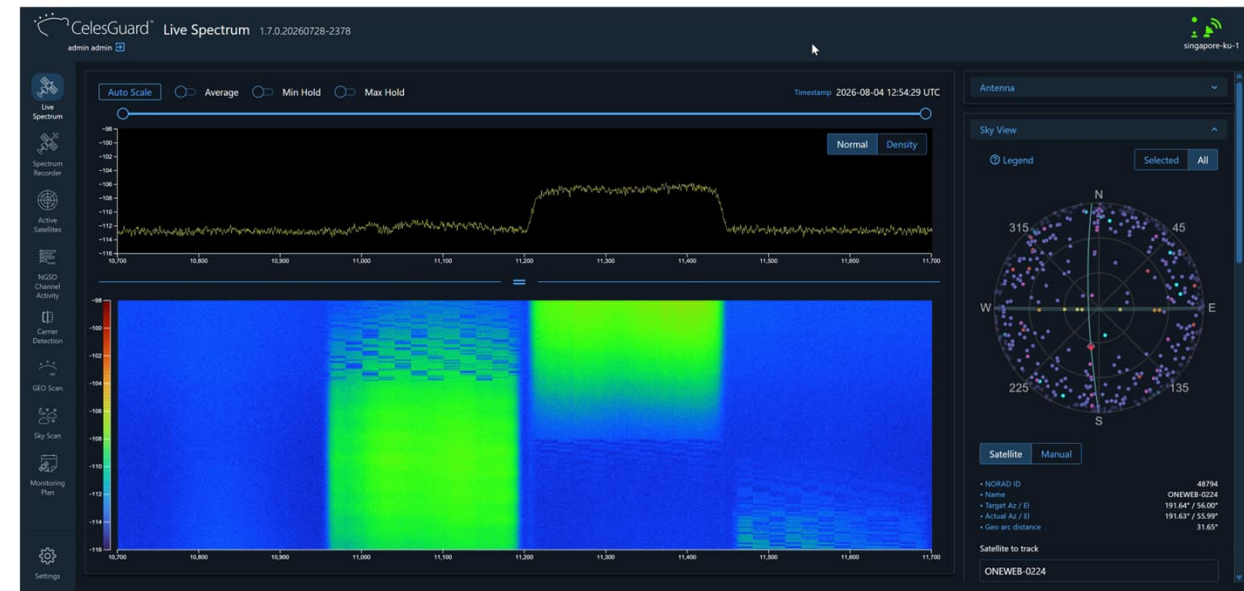
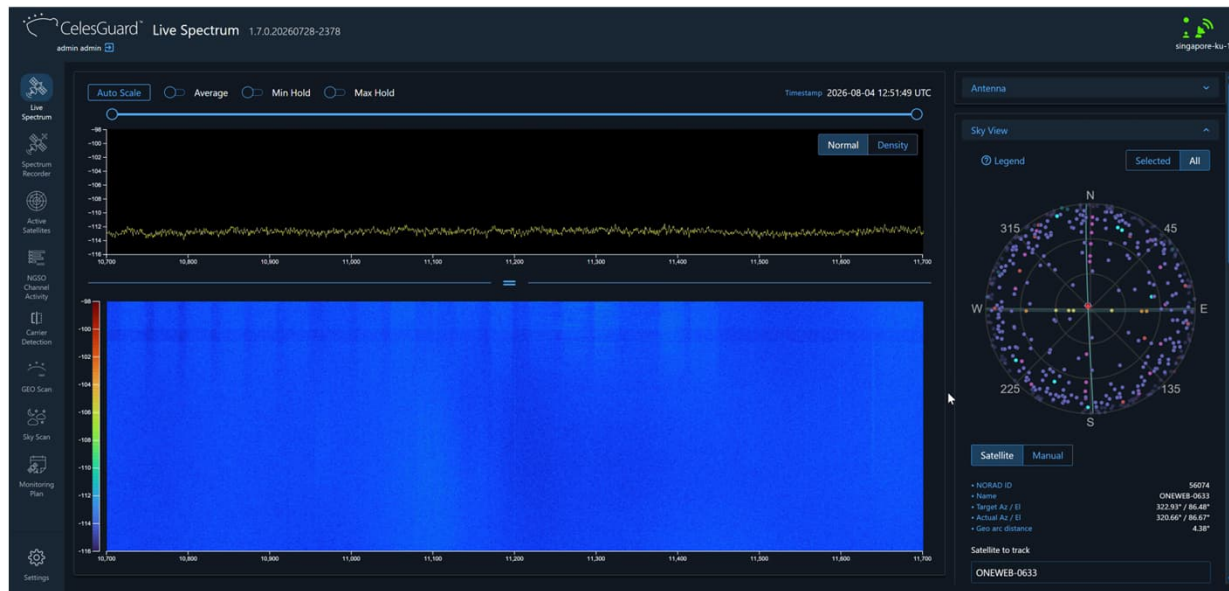
Downlink Interference



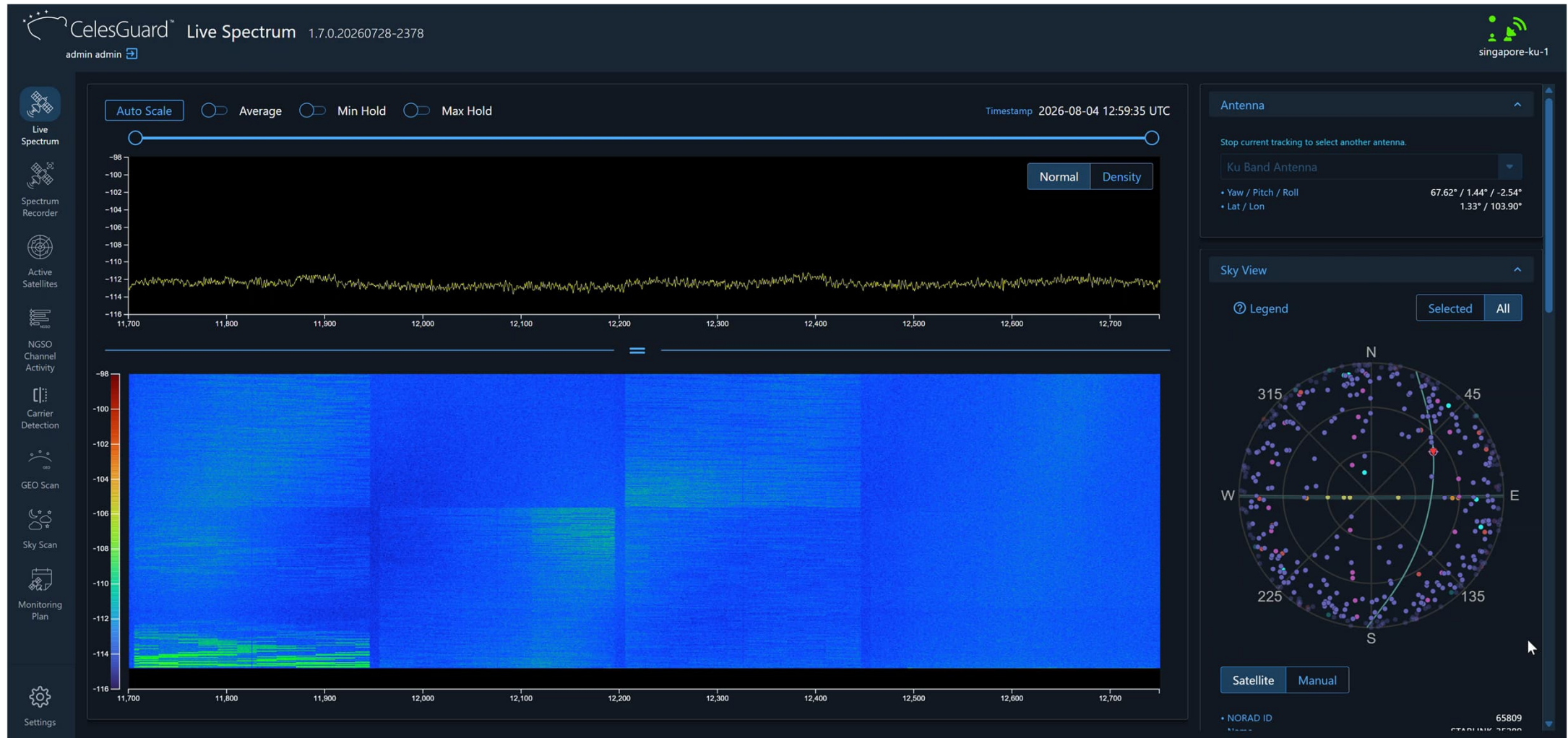
Uplink Interference



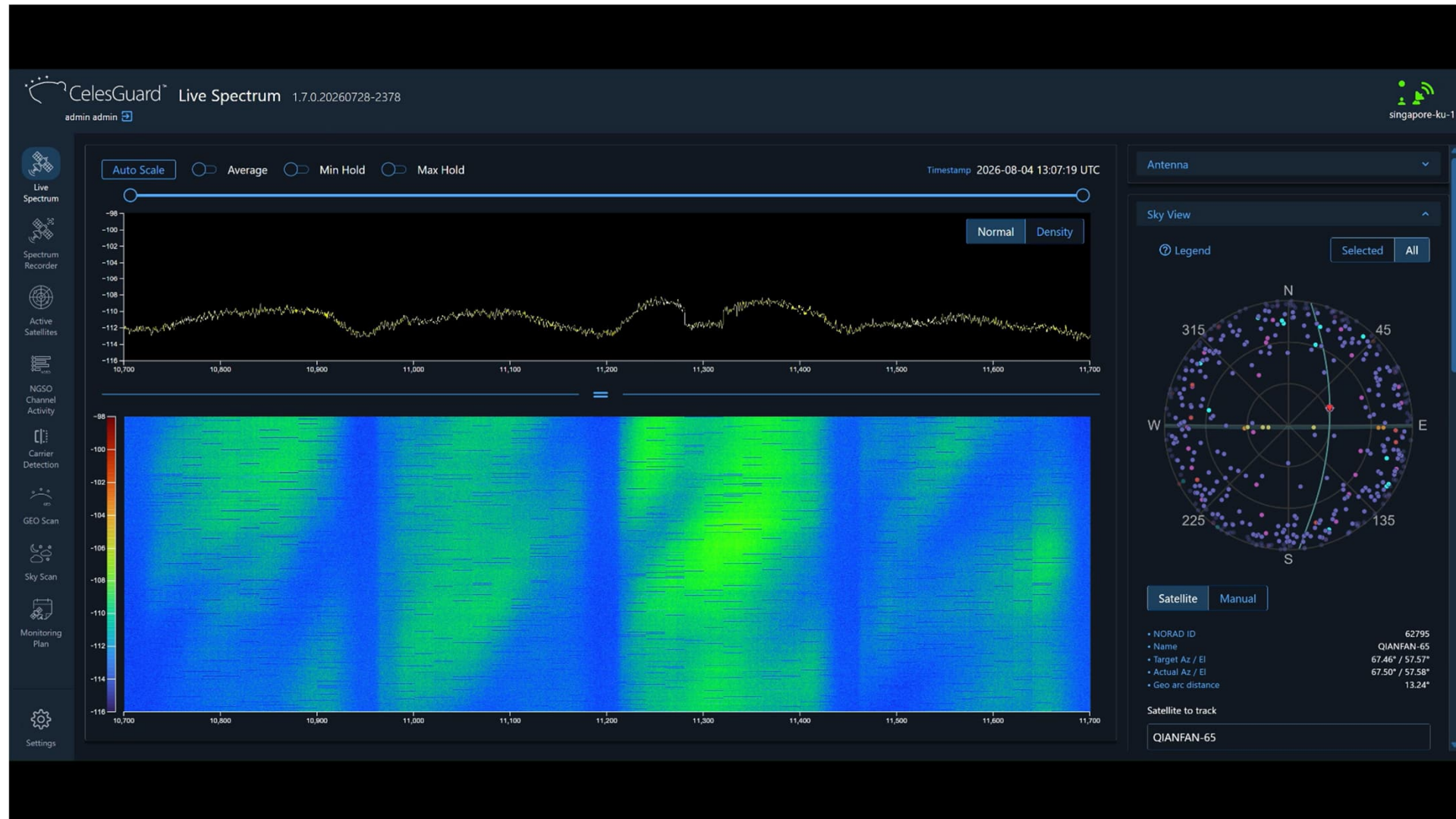
NGSO / GSO Coordination - OneWeb



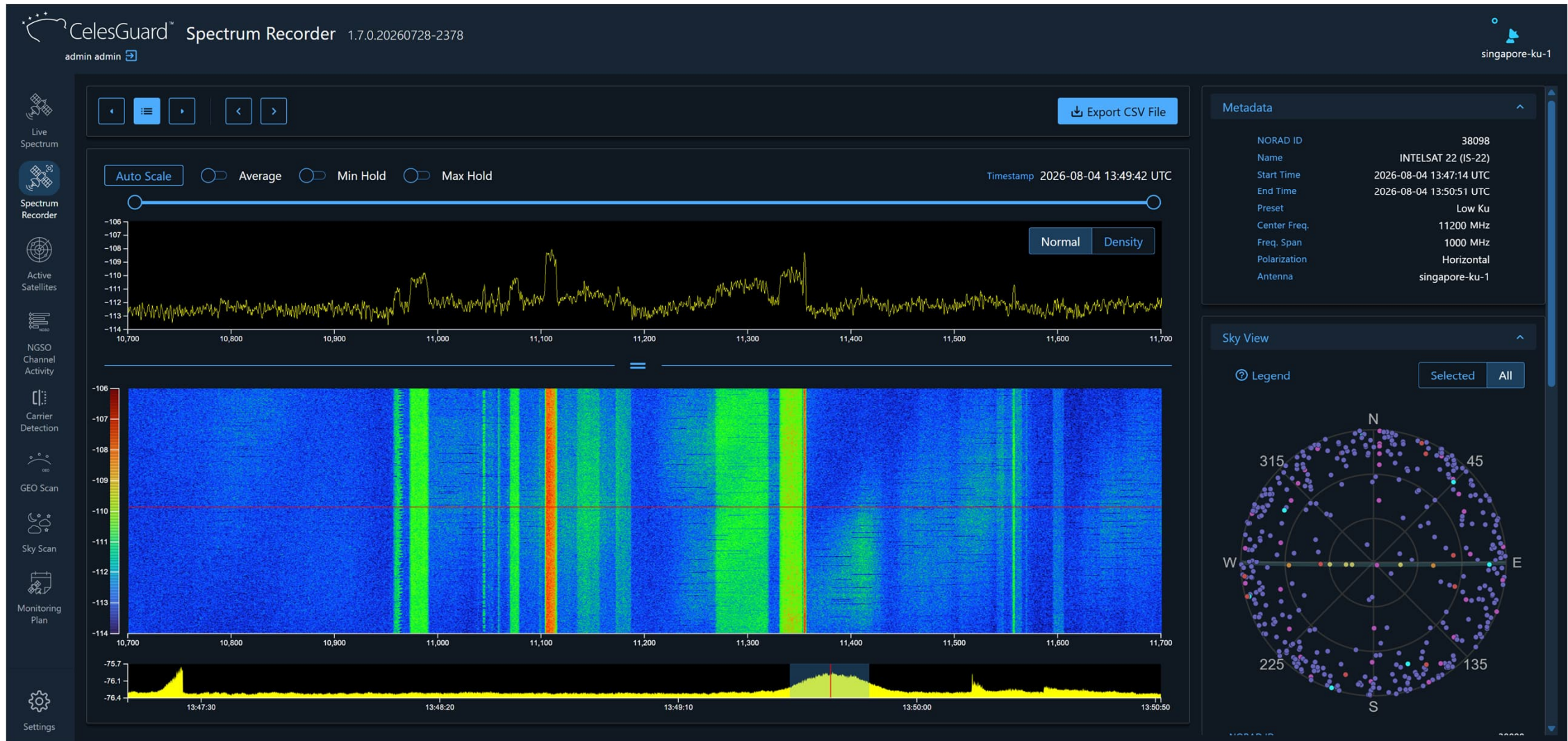
NGSO / GSO Coordination - Starlink



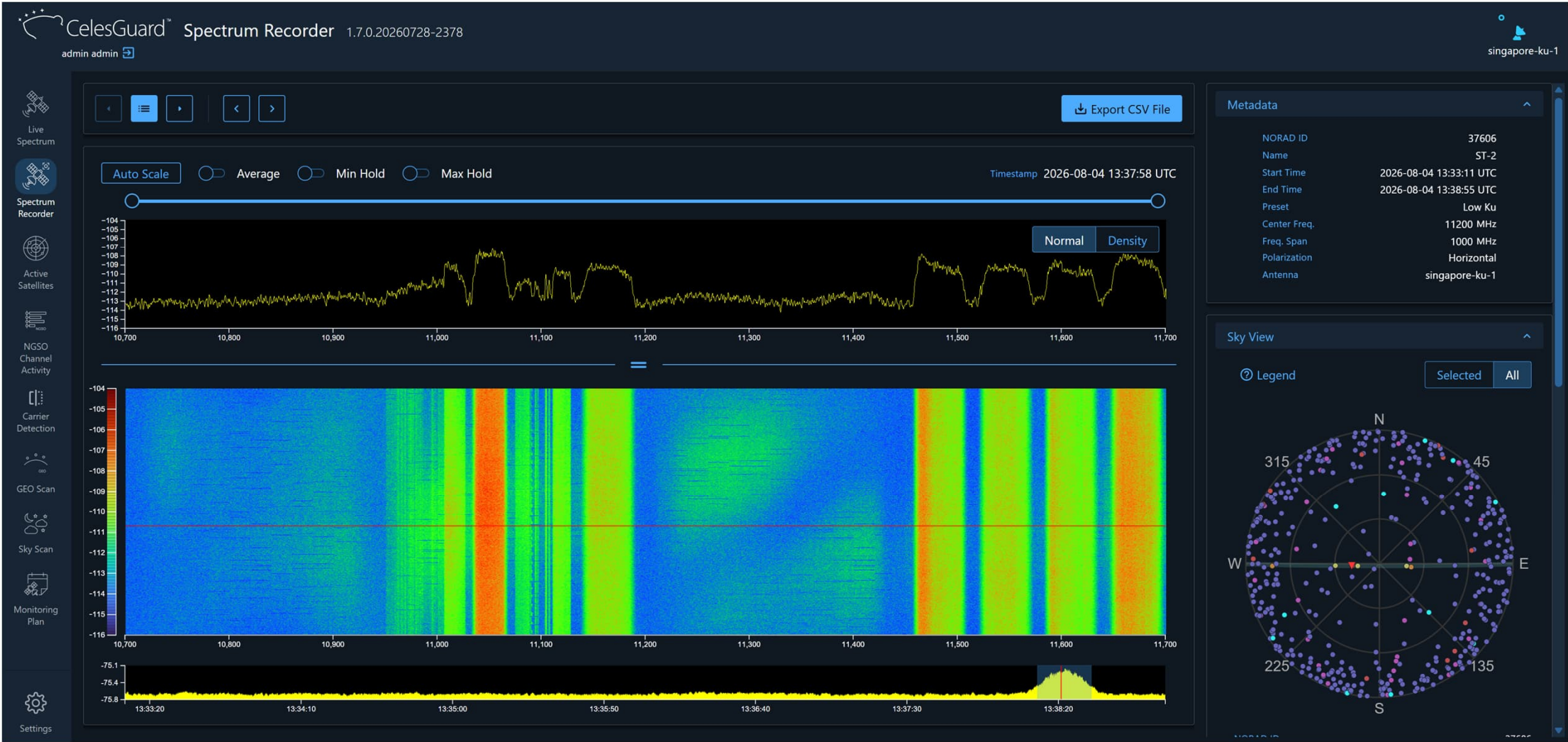
NGSO / GSO Coordination - Qianfan



NGSO / GSO Coordination – Qianfan / INTELSAT 22



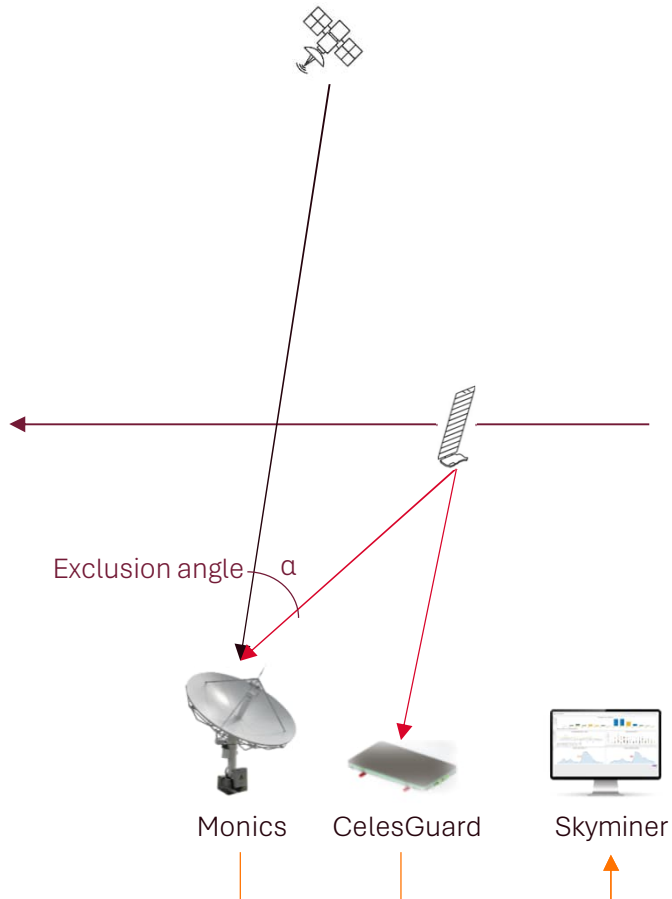
NGSO / GSO Coordination – Qianfan / ST2



Conclusion



Conclusion



- 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





Contact Us



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