

SAFRAN DATA SYSTEMS IN SPACE

Committee on the Peaceful Uses of Outer Space

- 2024 -

Sixty-seventh session

19th-28th June 2024



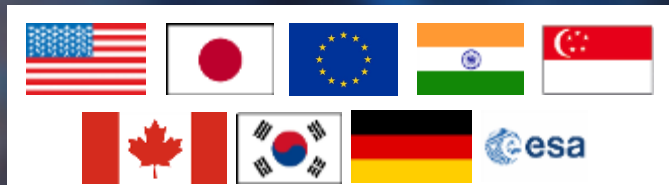
Thierry Balanche
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GLOBAL PRESENCE, GLOBAL CUSTOMERS

Through system integrators



Directly to Space Agencies and International MoD



To the New Space



A GLOBAL SPACE EQUIPMENT & SOLUTIONS PROVIDER



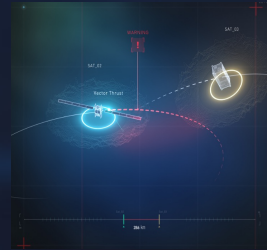
Electric propulsion systems



On-board & ground optics



Telemetry, TT&C & Communication



Space & Spectrum Awareness



Timing & radio-navigation



Launch-vehicle instrumentation & navigation

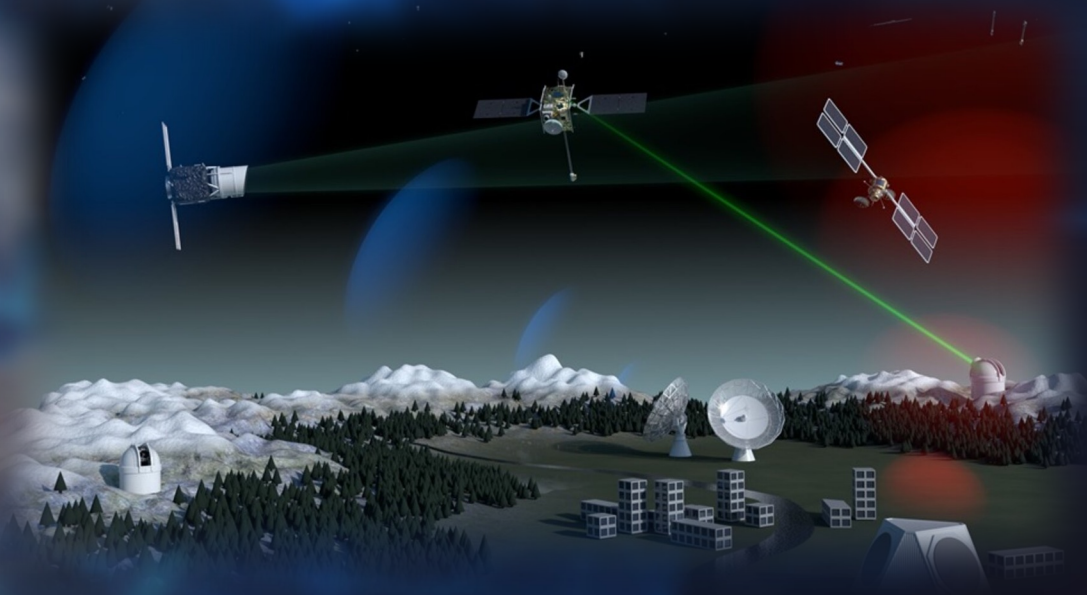
Other space solutions by Safran:

- Simulation solutions
- Electrical Ground Support Equipment
- Engineering Services
- Harness and cabling
- Valves and filtration
- Step motors for satellites

In addition to:
50/50 JV with Airbus



PASSIVE RF TO AUGMENT SPACE SITUATIONAL & DOMAIN AWARENESS



With the courtesy of ESA: https://www.esa.int/ESA_Multimedia/Images/2017/04/Surveillance_network ; copyright ESA/Alan Baker, CC BY-SA 3.0 IGO

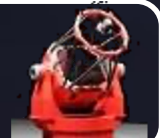
■ Ground - Radar

- + Efficient on debris and satellites in LEO
- Cost, limited efficiency on MEO / GEO arc.



■ Ground – Optical

- + Detects active or passive objects and debris
- Day / night and weather constraint



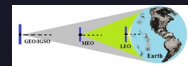
■ Ground– Radio

- + No day / night and weather constraint.
- Limited to RF active objects



■ Space Based

- + Closest detection and monitoring
- Relative speeds





Satellite Communication & Situational Awareness

Products & Services

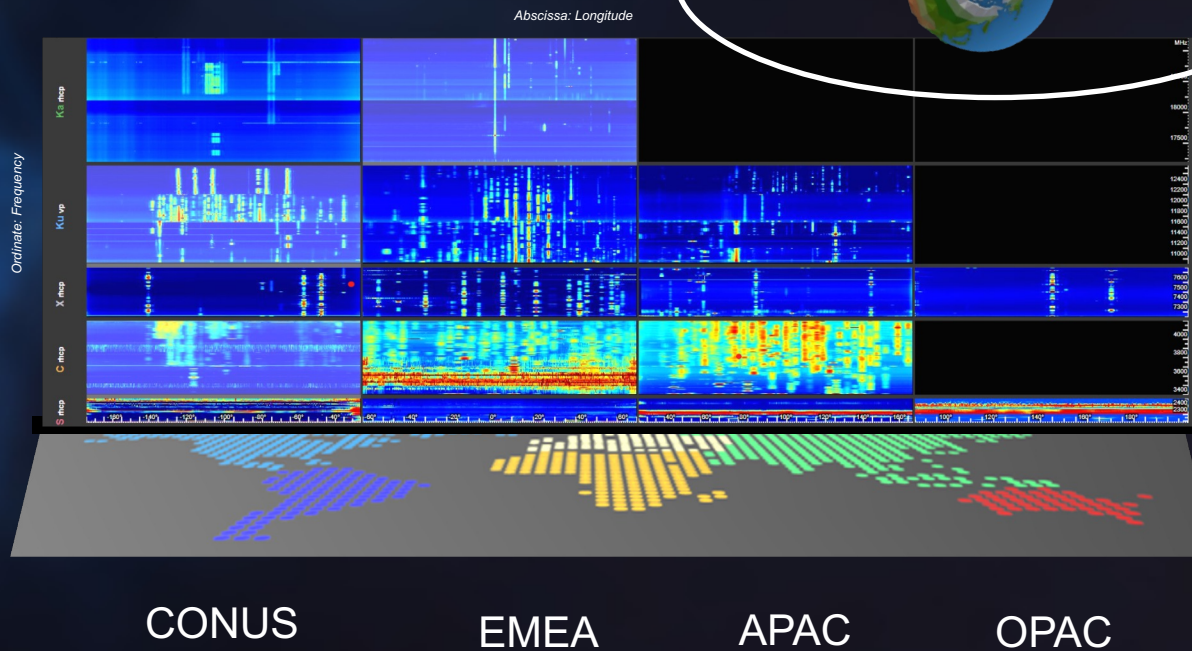
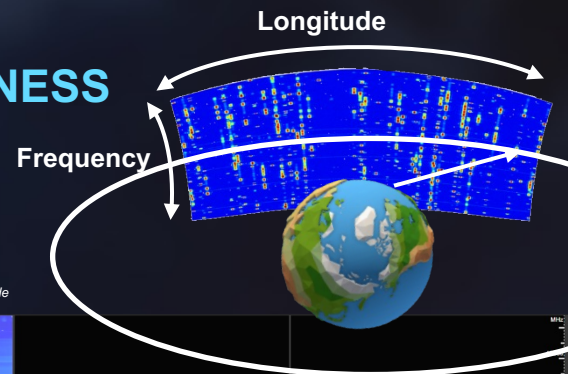
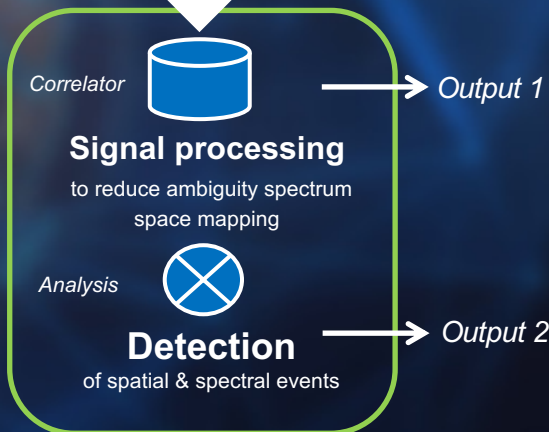
SATELLITE COMMUNICATION & SITUATIONAL AWARENESS



Cued and uncued signal watch of unknown satellites based on passive RF delivering
always-on spectral usage of orbits of interest

SATELLITE COMMUNICATION & SITUATIONAL AWARENESS

Spectral monitoring



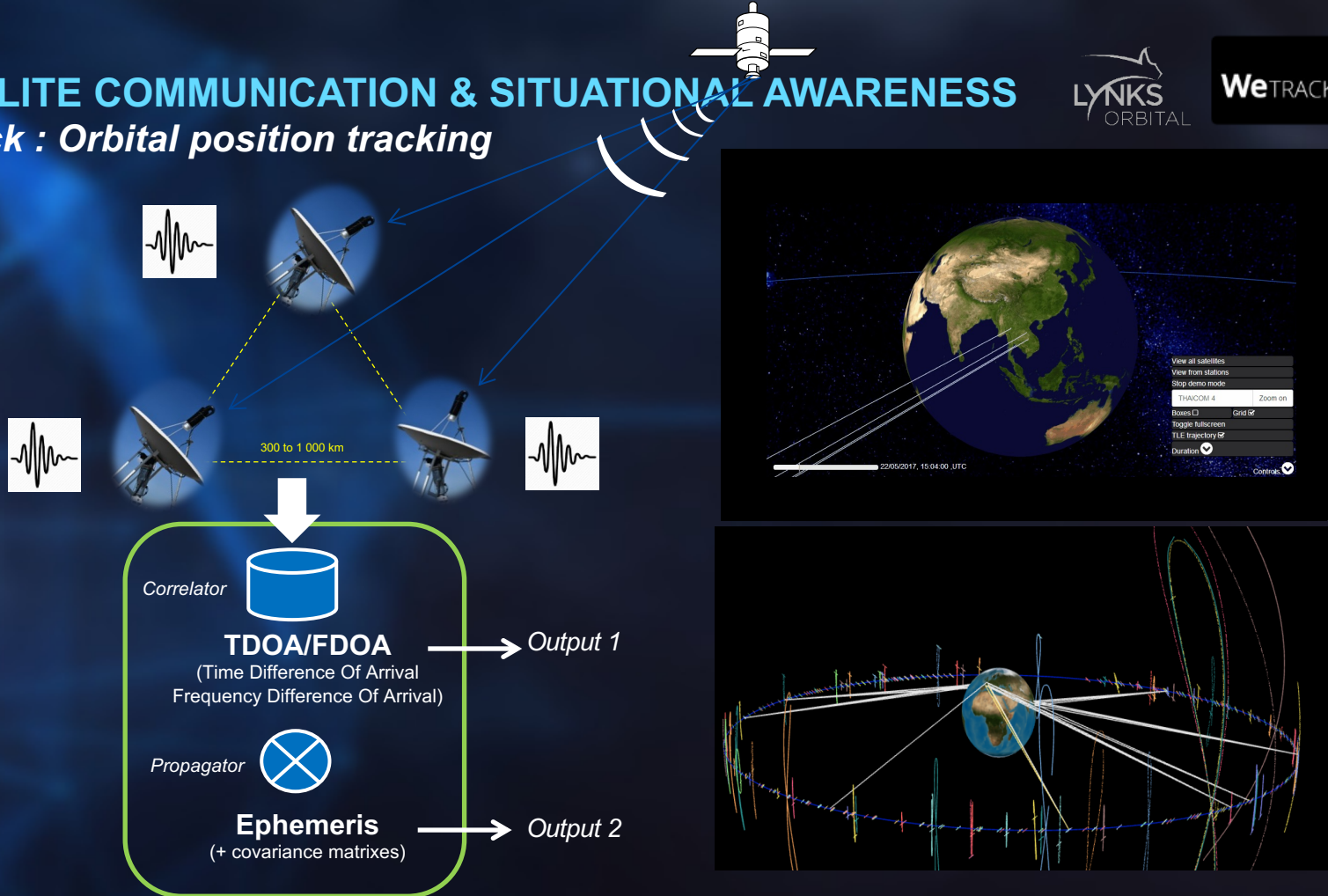
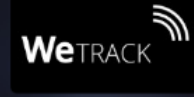
SATELLITE COMMUNICATION & SITUATIONAL AWARENESS



Cued tracking of satellites based on passive RF, delivering persistent orbital positions and immediate maneuver detection.

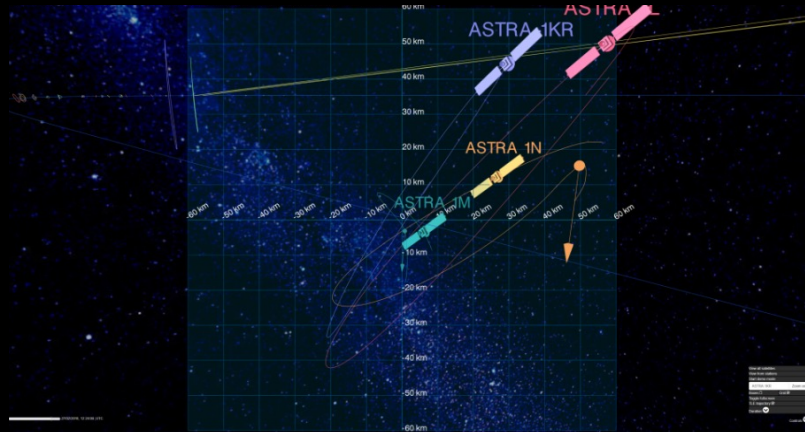
SATELLITE COMMUNICATION & SITUATIONAL AWARENESS

WeTrack : Orbital position tracking



SATELLITE COMMUNICATION & SITUATIONAL AWARENESS

WeTrack™ : Use cases

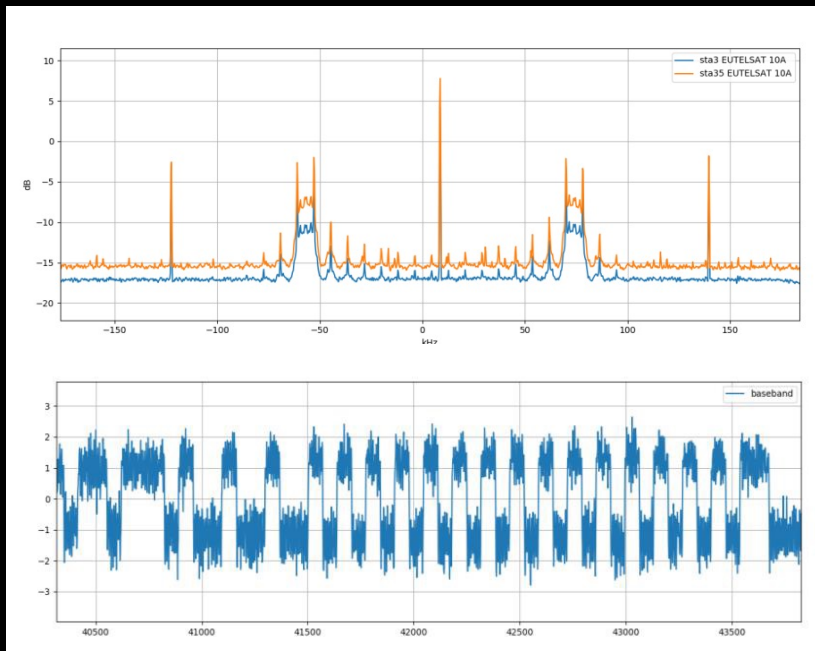


■ Early maneuver detection

- WeTrack detects maneuvers (high revisit rate);
- Eases the next optical observation association.

SATELLITE COMMUNICATION & SITUATIONAL AWARENESS

WeTrack™ : Use cases



■ Early maneuver detection

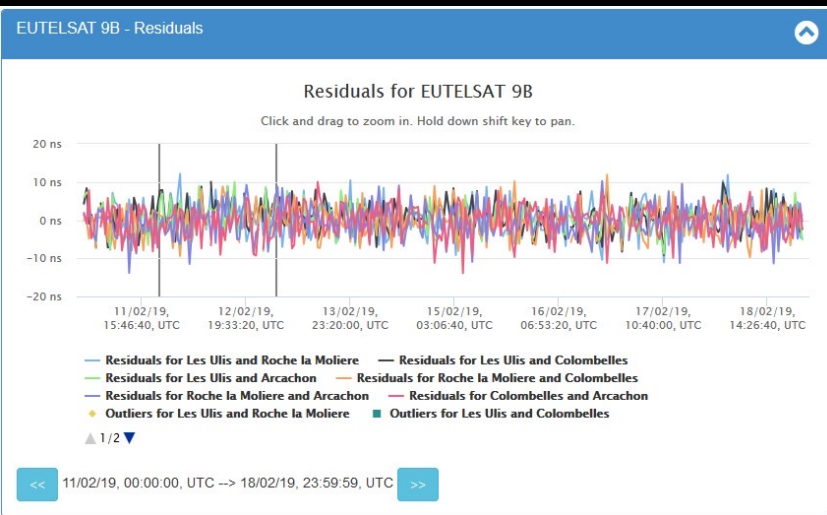
- WeTrack detects maneuvers (high revisit rate);
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■ Satellite Characterisation

- Unique satellite identification and characterization from the injection on the telecoms and telemetry (even in Spread Spectrum)

SATELLITE COMMUNICATION & SITUATIONAL AWARENESS

WeTrack™ : Use cases



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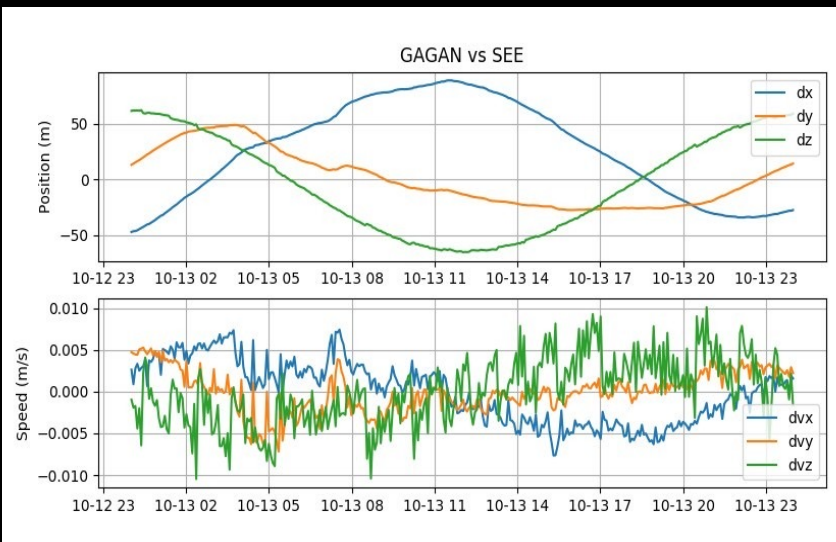
- Unique satellite identification and characterization from the injection on the telecoms and telemetry (even in Spread Spectrum)

■ Behavior study

- Recording of all available data for analysis

SATELLITE COMMUNICATION & SITUATIONAL AWARENESS

WeTrack™ : Use cases



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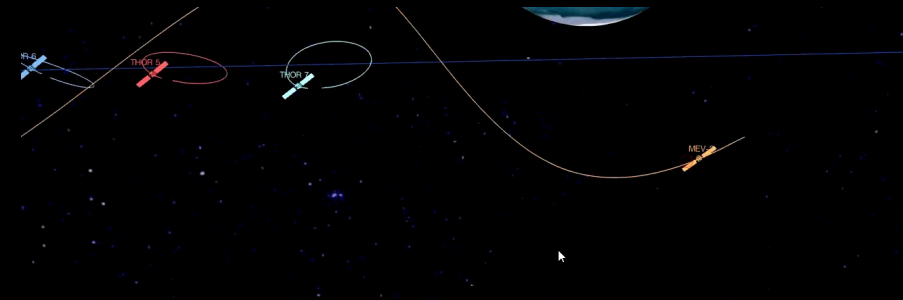
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■ Flight Dynamics

- Primary & Second source, Backup, Rescue, Calibration.

SATELLITE COMMUNICATION & SITUATIONAL AWARENESS

WeTrack™ : Use cases



■ Tracking Drift / Relocalisation

- Constant tracking of the satellite drifting.

■ Surveillance of ASSETS/slots

- Scanning few degrees around a satellite slot to detect any approaching satellite.

■ Tracking satellite of interest

- Tracking with a high revisit rate any satellite of interest of in close approach.

■ In Orbit servicing

- Continuous tracking on the payload and/or telemetry signals
- Upmost accuracy due to measurements error bias cancellation
- No cross tagging

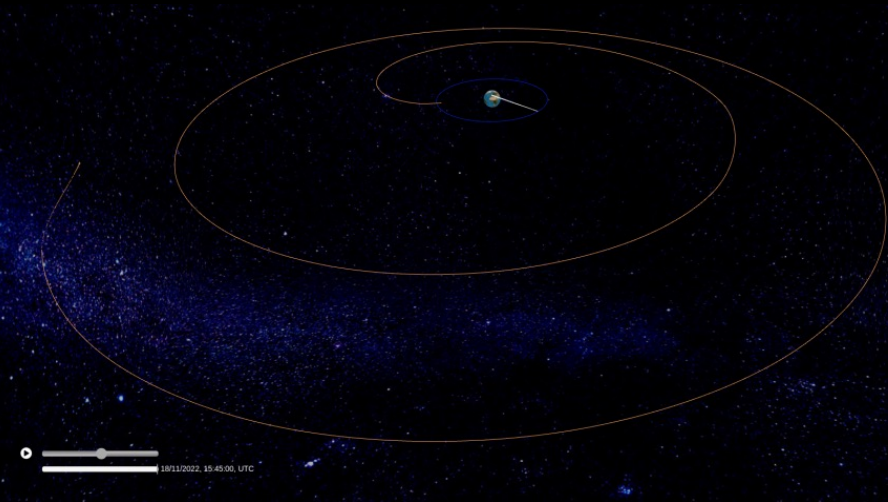
SATELLITE COMMUNICATION & SITUATIONAL AWARENESS

WeTrack™ : Use cases



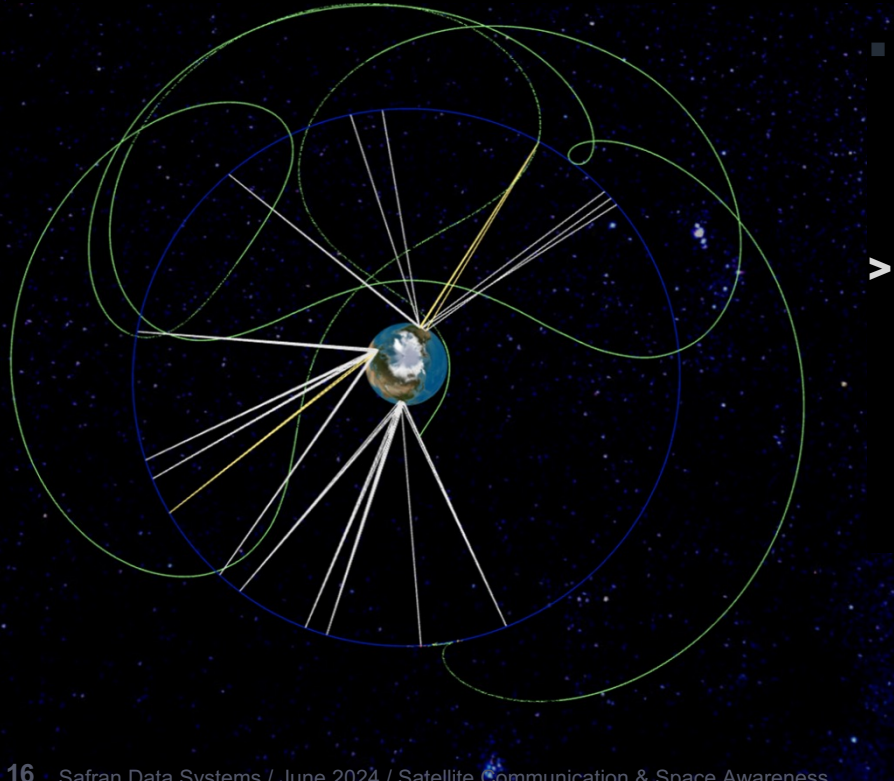
■ XGEO tracking

- Continuous tracking of Artemis-Orion mission
- Data available on Chandrayaan-3
- Continuous tracking of Intuitive Machine



SATELLITE COMMUNICATION & SITUATIONAL AWARENESS

WeTrack™ : Use cases



■ XGEO tracking

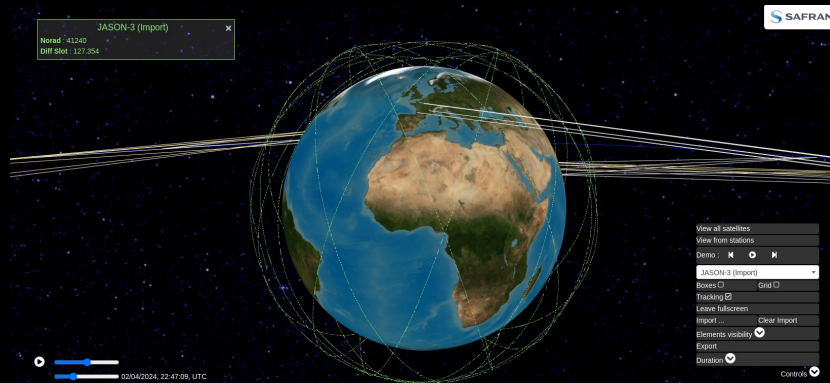
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➤ LEOP tracking

- Tracking in cooperative mode of TELKOMSAT-HTS 113BT

SATELLITE COMMUNICATION & SITUATIONAL AWARENESS

WeTrack™ : Use cases



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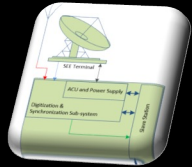
➤ LEOP tracking

- Tracking in cooperative mode of Telekom 13

➤ LEO tracking

- All sensors have been updated to track NGSO satellites and all are multi-task capable (Watch/Track on all orbits).
- Commitment to track >4000 satellites mid 2025
- LEO service start planned beginning of 2025

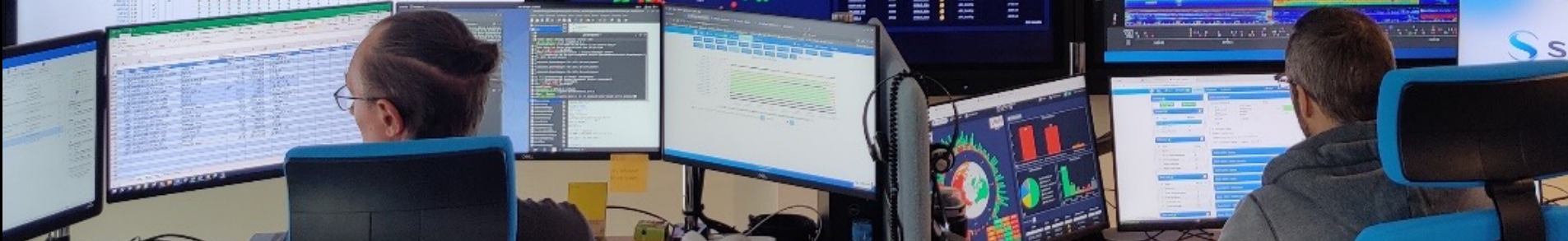
RF passive 3 stations (minimum Wetrack baseline)



- Energetic spectrum scanning (WeWatch)

- +1 RF passive station for:
 - Redundancy
 - Performance





THANK YOU FOR YOUR ATTENTION

