



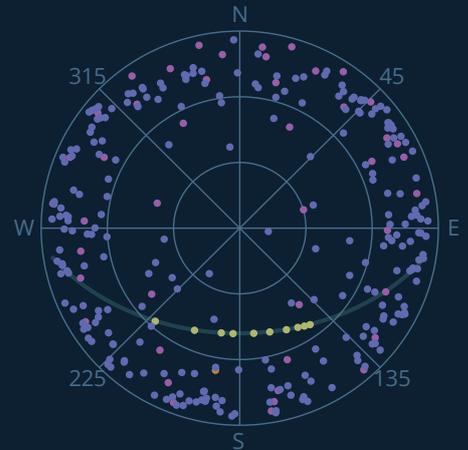
Satellite Spectrum Monitoring System

In just a few years, high-throughput satellite constellations have revolutionized global communications. Today, these satellites—now comprising the majority of active objects in orbit—play a pivotal role in delivering broadband internet to remote and underserved communities, while also supporting disaster management and defense applications. Their strategic importance is undeniable.

Crowded Skies

Traditional monitoring approaches struggle to keep pace with the new satellite constellations because of two main challenges:

- **Number of satellites in orbit:** Dozens—and soon potentially hundreds—of satellites may transmit over the same ground area simultaneously. Their unpredictable scheduling makes comprehensive monitoring difficult.
- **Narrow beam sizes:** Advanced constellations use phased array antennas to dynamically generate narrow, user-directed beams, which often evade detection by traditional centralized monitoring stations.



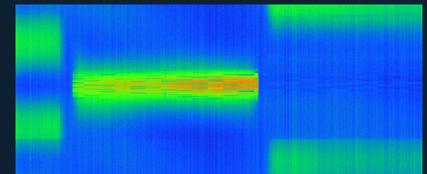
Distributed Monitoring Network

To tackle these challenges, we developed CelesGuard—a distributed network of maintenance-free, “deploy-and-forget” nodes. These compact, interconnected devices feature electronically steerable antennas and edge computing capabilities for on-site signal processing. Whether installed in fixed locations or mounted on mobile platforms, they offer broad and adaptable coverage.



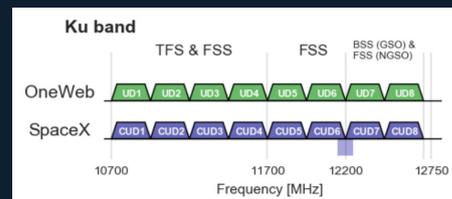
Interference Detection and Identification

LEO and MEO constellations operate within strict technical and regulatory confines, notably the scarcity of available radio spectrum. This limited spectrum forces the sharing of frequency allocations among LEO, MEO, and GEO satellites. CelesGuard empowers users to swiftly identify interference issues that arise from the coexistence of multiple satellite networks.



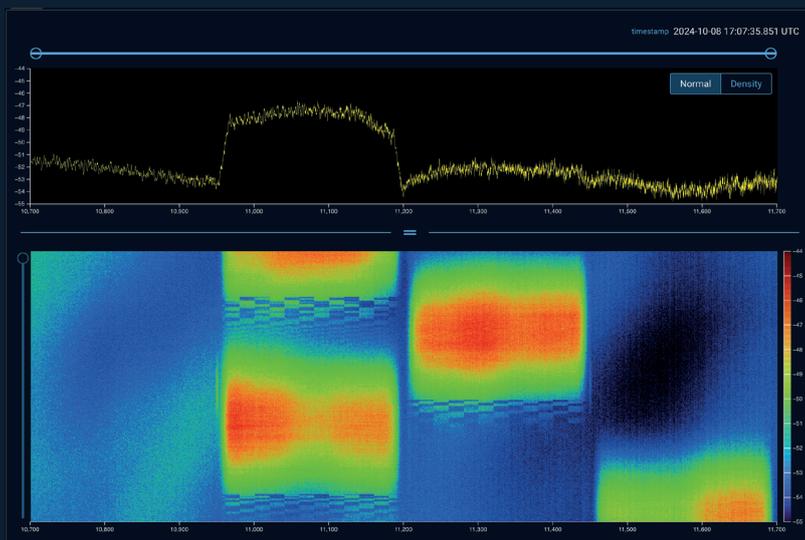
Regulatory Compliance Verification

Given the intricate international and historical context, LEO and MEO satellite constellations are governed by a stringent regulatory framework. CelesGuard assists in monitoring satellite operators' adherence to licensing agreements and international regulations, operating in both cooperative and non-cooperative modes.

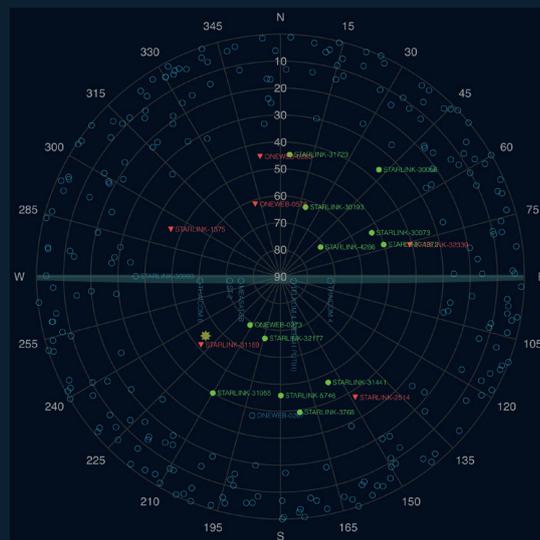


Intelligence Gathering

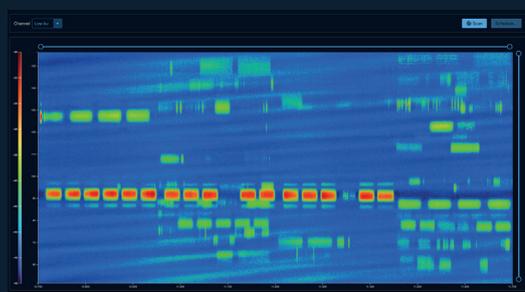
Several large satellite constellations set for launch will soon enable their operators to establish covert, high-speed communications from any location on Earth, potentially without detection. CelesGuard supports the defense and intelligence community in gaining a more comprehensive understanding of RF activity in LEO and MEO.



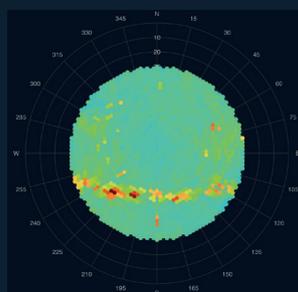
Live spectrum monitoring & recording



Satellite activity monitoring



Geostationary arc scan



Sky scan



Patterns-of-life analysis