Radio Occultation related Space Weather activities at EUMETSAT

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EUMETSAT, the European Organisation for the Exploitation of Meteorological Satellites, operates a fleet of satellites that continuously monitor the atmosphere, oceans, and land surfaces - 24 hours a day, 365 days a year - to support weather and climate services. While the primary focus has traditionally been on the neutral atmosphere, recent years have seen growing interest from EUMETSAT's user community in Space Weather data. This has led to the expanded use of satellite observations for monitoring the ionosphere and plasmasphere.

One of the instruments onboard all polar-orbiting EUMETSAT satellites is the GNSS Radio Occultation (RO) receiver. The GRAS receiver is currently flying on the Metop-B and Metop-C satellites of the EPS (European Polar System) mission. Its successor, GRAS-2, is deployed on all satellites of the EPS-SG (EPS-Second Generation) mission. Metop-SGA1, the first EPS-SG satellite, was launched on 12 August 2025 and is currently undergoing commissioning. It will be joined by Metop-SGB1 (scheduled for launch in Q3 2026), and subsequently, new satellite pairs will be launched every 7.5 years to ensure continuous coverage with two LEO satellites in sun-synchronous orbit (09:30 early morning orbit) until approximately 2050.

Both GRAS and GRAS-2 receivers perform atmospheric and ionospheric sounding- up to 300 km on Metop-B/C and up to 600 km on Metop-SGA1 - and deliver ionospheric data in near real-time, supporting the Space Weather community.

This contribution provides an overview of EUMETSAT's Space Weather activities within the framework of its radio occultation missions. It focuses on the data processing chain and the ionospheric products routinely made available, including bending angle profiles, scintillation measurements, and topside Total Electron Content (TEC).