



Radio Occultation ionospheric products from EUMETSAT satellites: overview and validation

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EUMETSAT, the European Organization for the Exploitation of Meteorological Satellites, monitors weather and climate by operating a system of meteorological satellites that observe the atmosphere, ocean and land surfaces 24 hours a day, 365 days a year. Even if in the atmosphere the main monitoring target of the organization is its neutral part, in the last few years there has been an increased interest in EUMETSAT's user community for Space Weather data. This has driven the exploitation of data from EUMETSAT satellite missions also for the ionosphere/plasmasphere monitoring.

One of the payload available in all the polar-orbiting EUMETSAT Metops satellites is a GNSS Radio Occultation receiver (the GRAS receiver). In the framework of the summer 2020 Metop-A end-of-life testing campaign, EUMETSAT had the opportunity to test an updated configuration of the instrument, which extended its vertical measurement range into the lower and mid ionosphere (up to 300 km and up to 600 km in two different experiments).

Metop-A reached its end-of-life and was deorbited at the end of 2021. However, it was verified that the GRAS instrument is capable of performing useful ionospheric measurements. As a result, in Q1/2022 the remaining receivers on-board Metop-B and C will be configured to collect operationally data up to 300 km and to provide ionospheric data to the users in near real time.

This contribution presents an overview of the Space Weather activities performed at EUMETSAT in the framework of the radio occultation missions. In particular, it will provide the details about the ionospheric products (ionospheric bending angles profiles, scintillation profiles and topside TEC) that EUMETSAT plans to generate and make available to the users. Moreover, during 2021/2022 EUMETSAT funded a study (GIMA: Assessment of GRAS Ionospheric measurements for Ionospheric model assimilation), with the purpose of complementing the GRAS instrument assessment with an ionospheric data assessment, including processing of relevant ionospheric data for their future assimilation into ionospheric models. This contribution will also provide a summary of the results obtained within this study.