Ground support network for the Metop GRAS atmospheric sounding mission

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EUMETSAT, through the EUMETSAT Polar System (EPS) Programme, and ESA, through the Metop Programme, have jointly undertaken the development of a European satellite system for operational meteorology and climate monitoring from polar orbit. The GNSS Receiver for Atmospheric Sounding (GRAS) is an instrument on board each MetOp spacecraft, which can track GPS signals. These signals may be used for MetOp Precise Orbit Determination (POD) and for atmospheric sounding, which is based on measuring the refraction of these signals through the Earth's atmosphere.

The GRAS Ground Support Network (GSN) is the element providing the auxiliary data that are necessary to process the data of the GRAS instrument. This support data consists of:

- High-rate ground tracking data of GPS spacecraft by on-ground GPS receivers globally distributed, for the generation of atmospheric sounding products.

- GPS orbit and clock determination-related products

- Auxiliary files

The GRAS GSN consists of a global network of GPS receiver stations, delivering GPS raw measurements to a Processing Centre (GSNPC), which is located at ESOC. It is operating fully automatically in two parallel processing chains, one near-real-time and one off-line, generating independent products.

This paper will provide an overview of the GRAS GSN system that was designed and developed by the ESA Navigation Support Office at ESOC, and how it interacts with the occultation processing facility at the core ground segment in EUMETSAT. It will also provide an assessment of the GSN service performance based on its successful first year of operation, in particular with respect to GSN product accuracy and availability.