



## **Climate data based on radio occultation measurements by the GRAS/METOP instrument**

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The GNSS (Global Navigation Satellite System) radio occultation (RO) technique utilizes the refraction of radio waves to probe the Earth's atmosphere through satellite-to-satellite limb sounding. The phase delays as a function of time - which is the fundamental observable - can be converted to bending angle, refractivity, pressure, temperature, and humidity as a function of height. Many of the characteristics of RO data suggest them as a near-ideal resource for climate studies, particularly the global coverage, the all-weather capability, and the self-calibrated nature of the data. The latter property should allow for relatively easy inter-comparison of data from different satellites and RO instruments, which is required to construct long time series covering many years and even decades.

The GRAS RO instrument onboard EUMETSAT's polar orbiting meteorological satellite MetOp now provides an opportunity to create RO based climatologies of high quality, adding to data from other RO missions. For these purposes, we are currently undertaking studies on how to best exploit the GRAS RO data, both for construction of an accurate single-source climate data base with known error characteristics of the data and for provision of global climate monitoring.

In this poster, we present the first GRAS SAF climate data derived from GRAS/MetOp measurements. We discuss the relative merits of using standard (pressure, temperature, humidity) versus non-standard (bending angle, refractivity) geophysical variables to produce the climatologies. We also discuss how to estimate the error characteristics - random observational/sampling errors and systematic biases - of the GRAS RO data and their consequences for the construction of accurate climatologies.