

GENERIC PROCESSING OF GPS RO AND MICROWAVE OCCULTATIONS

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The processing of radio occultation (RO) data consists of a number of steps. This presentation will focus on the steps following the generation of bending angles, i.e., in the case of GPS RO, the steps leading to profiles of refractivity, temperature, pressure, and humidity. In general, the major steps to obtain the refractivity are: 1) ionospheric correction of bending angles; 2) statistical optimization and extrapolation at high altitudes; 3) application of the Abel transform. Each of these steps will be discussed from a general view point, supplemented with specifics of (and results from) the processing at the GRAS SAF Processing and Archival Center (GPAC). Further processing of the data to temperature, pressure, and humidity can be done in many ways, but all include auxiliary information, e.g., from a numerical weather prediction model. The pros and cons of different methods suggested and studied over the past many years will be discussed. The presentation will also cover the general aspects of the processing of microwave occultation data, using frequencies sensitive to water vapor and ozone in the range 10-200 GHz. The principle here is to measure, in addition to the refraction, the absorption between transmitters and receivers in low earth orbit. In this way, future microwave occultation satellite missions will enable retrievals of temperature and humidity without the use of additional information from models or other sources.