PROCESSING OF METOP/GRAS OPEN LOOP RADIO OCCULTATION DATA AT CDAAC

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The METOP/GRAS GPS radio occultation (RO) receiver is the first RO receiver providing occultation signals for a single occultation sampled at two rates, 50 Hz (closed loop mode) and 1 kHz (open loop mode). The 1 kHz open loop data at the bottom of occultations are intended to extend the retrieved profiles down to the lower troposphere. In many occultations, the 1 kHz sampled RO signals have time intervals with missing data (gaps). Different sampling rates and data gaps pose a challenging task: an automated processing of the METOP/GRAS data to retrieve bending angle and refractivity profiles for use by weather centers. In this presentation we discuss METOP/GRAS data processing at the COSMIC Data Analysis and Archive Center (CDAAC). The automated processing includes conversion of the RO signals to one sampling rate. For evaluation of the effect of the open loop data we process the RO signals in different modes: closed loop data only; closed loop and open loop data down to the first gap; closed loop and all open loop data. We perform a statistical comparison of the profiles retrieved in different modes with ECMWF analysis. For evaluation of the effect of gaps in the open loop data we perform a comparison of the profiles retrieved from COSMIC RO signals with and without artificially introduced data gaps. Low-level data formatting software for the GRAS receiver was developed in part under a structural uncertainty study funded by EUMETSAT using pyGRAS software supplied by EUMETSAT.