POST-PROCESSING OF COSMIC OPEN-LOOP RADIO OCCULTATION SIGNALS AT CDAAC

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Strong phase and amplitude fluctuations of radio occultation (RO) signals in the moist troposphere often result in significant errors of the phase recorded by a GPS receiver in the closed-loop mode. To overcome this problem, COSMIC RO receivers record GPS L1 RO signals in the troposphere in the open-loop (OL) mode, by modeling the phase of RO signal without a feedback and applying 50 Hz sampling rate which is close to Nyquist limit. In order to invert the OL RO signals, the GPS navigation data modulation (NDM) has to be removed and the phase has to be connected between samples in the post-processing. This requires more accurate modeling of the RO signal frequency than in COSMIC receivers. The methods of the frequency modeling and removal of the NDM applied by the COSMIC Data Analysis and Archiving Center (CDAAC) will be discussed in the presentation. Statistical comparison of the inversion results (retrieved refractivity) in the tropical troposphere by use of different methods of the frequency modeling and removal of the NDM will be presented.