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Interactive comment on "Estimation and Evaluation of COSMIC Radio Occultation Excess Phase Using Non-differenced Measurements" *by* Pengfei Xia et al.

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In this study, a non-differenced (ND) processing strategy is proposed to estimate the AEP. To begin with, we used PANDA (Positioning and Navigation Data Analyst) software to perform the precise orbit determination (POD) for the COSIMC (The Constellation Observing System for Meteorology, Ionosphere and Climate) satellite to acquire the position and velocity of the center of mass of the satellite and the corresponded receive clock offset. The bending angles, refractivity and dry temperature profiles are derived from the estimated AEP by the ROPP (Radio Occultation Processing Package) software. The ND method is validated by the COSMIC products in typical rising and setting occultation events.In addition, we also compared the relative refractivity

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bias between ND-derived and “atmPrf” profiles of globally distributed 200 COSMIC occultation events on December 12, 2013. The observed COSMIC refractivity profiles from ND processing strategy are further validated using European Centre for Medium-Range Weather Forecasts (ECMWF) analyses data, and the results indicate that non-differencing reduces the noise level on the excess phase paths in the lower troposphere compared to single difference processing strategy.

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