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Atmospheric Measurement Techniques Discussions

Interactive comment on "Application of locality principle to radio occultation studies of the Earth's atmosphere and ionosphere" *by* A. G. Pavelyev et al.

Anonymous Referee #3

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This manuscript describes the application of a newly developed method to analyse radio-occultation, the locality principle. It consists in the comparison between the measured attenuation and estimation of the refractive attenuation from phase path excess acceleration. The two terms should be equal in absence of atmospheric or ionospheric absorption. Although radio-occultation measurements in Earth and planetary atmospheres are performed since 40 years, this basic principle has been neglected up to now. The authors derive several important finding from the application of this principle to the determination of the microwave absorption in the troposphere and to irregularities in ionospheric layers.

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Interactive Discussion
Discussion Paper

The paper is well written and with a comprehensive list of references. I recommend it for publication in AMT. I suggest adding a more detailed discussion on which parameters could be retrieved from the absorption in the troposphere. From Figures 2 and 3 we can conclude that the absorption is stronger in the equatorial region than at high latitudes, pointing to the role of absorption by water. However the absorption of water vapour at the GPS frequency is expected to be weak. I wonder if the liquid water may have an important contribution to this absorption.

Interactive comment on Atmos. Meas. Tech. Discuss., 8, 721, 2015.