

Anonymous Referee #1 comments on “Analysis of internal gravity waves with GPS RO density profiles” by P. Šácha et al.

This paper presents and evaluates a method for the analysis of IGWs from GPS RO density profiles. The authors discuss the problems of various background choices and examine the correspondence between analytical forms of the density and temperature background profiles. The important point of this paper is an attempt to analyze causes of increasing underestimation of RO spectral power toward higher wavenumbers. The paper may become suitable for publication in AMT following implementation of the following points.

Major comment:

1) Probably, an analysis of increasing underestimation of spectral power toward higher wavenumbers from GPS RO needs to be improved. The best way to do this is to give numerical estimates of contribution for such essential factors as filtering the RO data for ionosphere subtraction before the standard density and temperature retrievals, the GO technique and limited vertical resolution of RO data, the local spherical symmetry assumption, and the hydrostatic equilibrium assumption. It is known that PSDs for the IGW-induced normalized density and temperature perturbations must be correspondent with the theoretical saturated spectra at high vertical wavenumbers, but Figure 4 of the paper doesn't demonstrate this correspondence. Doing this numerical estimates would significantly strengthen the results of the paper.

Technical corrections:

- 1) Page 8330, line 10: please change **from** “2012.” **to** “doi: 10.1134/S0010952512010029, 2012.”
- 2) Page 8331, lines 1–2: please change **from** “Springer, Berlin Heidelberg, 165 – 178, 2009.” **to** “in: New Horizons in Occultation Research: Studies in Atmosphere and Climate, edited by: Steiner, A., Pirscher, B., Foelsche, U., Kirchengast, G., Springer-Verlag, Berlin Heidelberg, 165 – 178, doi:10.1007/978-3-642-00321_9, 2009.”
- 3) Page 8332, lines 8–9: please make an analogous correction in this Reference.