

Interactive comment on “Revisiting internal gravity waves analysis using GPS RO density profiles: comparison with temperature profiles and application for wave field stability study” by Petr Pisoft et al.

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Responses to the referee’s comment of paper “*Revisiting internal gravity waves analysis using GPS RO density profiles: comparison with temperature profiles and application for wave field stability study*” by Petr Pisoft et al.

1) *The spectra arising from GPS RO T or density data should then be expressed in the text as “apparent” or at least derived from “apparent” vertical or horizontal wavelengths measured from slanted soundings.*

C1

Thank you for this comment, it is a very good point and we will incorporate this suggestion into the paper.

2) *When you state in Sacha et al.(2014), after the hydrostatic hypothesis, that “...the whole group of nonhydrostatic IGWs is filtered out”, I understand that one consequence of this is that in any GW climatology obtained from GPS RO T data, only hydrostatic and hydrostatic rotating aspect ratios could be detected. If this is correct, how could it be explained the systematic and clear hotspots from obvious orographic (nonhydrostatic) origin above mountain regions, like at the southern tip of South America, reported in a considerable number of papers in the last decade showing global distributions (and its variability) of GW energy?*

In this paper, we intend to revise and correct this statement from Sacha et al., 2014. The hydrostatic temperature retrieval does not filter out any information. Instead, in case there are non-hydrostatic waves present, the density and temperature are not hydrostatically linked and the derived (GPS RO) temperature differs from the “real” temperature that would be observed directly. As pointed by the referee, this would be especially the case for the southern tip of South America.

Regarding the potential energy E_p for the southern tip of South America and other regions of a higher slope of IGW phase lines (higher E_p /kinetic energy of disturbances ratio), we refer to the discussion of Sacha et al. (2015), where it is noted that in such a region IGW activity can be overestimated using E_p from observations non-saturated spectra.

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