

Reply to anonymous referee #2

Review of doi: 10.5194/amt-2017-390

R. Rüfenacht et al. 2017

- blue: reviewer comments
- green: author replies

General comments:

- This work concerns the comparison of wind measurements using microwave and lidar. This work is important while very few wind measurements are available and observations, while difficult to evaluate, are essential for model evaluations. This work is pertinent for AMT.

Minor comments:

- Page 1: authors should refer to the background European project for such inter-comparison and should give some references about the project

We extended the the introduction in this sense: "... are at a very early stage. Such intercomparisons at multi-instrument sites are a key activity of the Horizon 2020 project ARISE¹ (Blanc et al., 2017). Previously, Lübken et al. (2016) presented..." with the footnote "¹<http://arise-project.eu>". We also mentioned this project at the beginning of Sect. 2: "Wind radiometer, lidar and meteor radar are all contributing to the before-mentioned ARISE project (Blanc et al., 2017)."

- Page 1 line 23: the region USLM is not often used, I suggest the use of Middle Atmosphere

We intentionally used the terminology upper stratosphere lower mesosphere (USLM) in this paper because it is more precise than middle-atmosphere. Indeed the core observations by the lidar and the radiometer do not cover the entire middle-atmosphere but rather the USLM which is also the altitude range where the gap of observations is present. In the lower stratosphere (which is included in the term middle atmosphere) wind a whole network of wind observations e.g. by radiosondes and radar wind profilers exists whereas the mesopause region and the uppermost part of the mesosphere can be assessed by different types of radar. The term USLM is also used by other authors (e.g. Baron et al. 2013). For this reasons we prefer to stick to the terminology USLM. We checked that the abbreviation is explained at the first occurrence in the abstract and the introduction

- Page 2 line 17 It concerns not only wind but temperature. Refer to Le Pichon

et al.

We agree that observational validations of middle-atmospheric temperature are also rare although MLS is providing global observations of temperature throughout the entire range between approximately 16 and 90 km. As we do not want to confuse the reader and make clear that the focus of the present paper lies on wind we added the reference to Le Pichon et al. in form of a footnote: “Le Pichon et al. (2015) noted that also middle-atmospheric temperature is a little-validated product.”

- Page 2 section 2 No reference is performed on Radiosondes. Figure 1 suggest that no RS exist at Andenes. Is it true?

It is true that there are no routine radiosoundings at Andenes. Some soundings have been performed on campaign basis, but not during the time period under investigation. This does however not negatively impact the present study because radiosondes generally reach top altitudes of 30-35 km and would thus not provide significant altitude overlap with the lidar or the wind radiometer anyway. The major general circulation models broadly assimilate radiosoundings and are validated against observations at these altitudes so that this is not the focus of the present study.

- Figure 9 and 10 Wind differences are difficult to estimate from these figures. Is it possible to provide differences instead of wind profiles?

We completely agree that it is hard to draw quantitative comparisons from Figs. 9 and 10. The primary aim of these figures is to present the time series showing how the dynamical patterns and their temporal evolution are captured by the different observations and models. This information would vanish when building differences between two data sources. For a more quantitative comparison the bi-monthly average profiles are shown in Figs. 11 and 12 where differences can easily be inferred by the reader. Moreover, there is no single data source covering the entire altitude range up to 10^{-3} hPa depicted in Figs. 9 and 10 what would be a necessary condition for a reference profile.