

We would like to thank the referee for the helpful and constructive comments. In the following we list specific referee comments (in blue) together with author replies. Additions and changes to the paper text are written *italic*.

1. Referee general remarks:

My general (minor) criticism would be that the paper is lengthy and makes the reading feel tedious at times. That being said, the methods are solid and the authors clearly demonstrate care in assessing and interpreting their results. So the criticism is purely with the presentation, and not the substance. That being said, I don't have a specific suggestion as to how to tighten up the paper. The same thing can be said about the figures: are all 14 of them essential?

Author reply:

The figures were carefully selected for their relevance. We agree that not all of the Figures present main results of our study, but we argue that all of the selected figures are essential to follow the discussion and explanations in the text.

2. Referee general remarks:

Another small criticism is in Sect. 2.2.1 ("Estimation of MH uncertainty"). I found it difficult to follow the methodology embodied in Eqs. 2~4. Could a figure of a Ri_g vertical profile and the different indices help the reader understand what is meant? Here I am suggesting an additional figure while earlier alluding to the fact that there being too many figures, so could the authors think about removing or consolidating a few of the figures?

Author reply:

Section 2.2.1. focuses on the application of an existing method. We believe our description is sufficient for the purpose of the present study. However, the method is the main subject of the cited study by Biavati et al, (2014). In this paper the method will be described in great detail and will include figures of observed and diagnosed profiles, i.e., temperature, humidity wind and Ri_g together with uncertainties. This manuscript is in an advanced state and will be submitted to Atmospheric Measurement Techniques in 2014. Therefore we avoided an additional figure in the present study, which is in line with the referees other comment (c.f. Referee Comment 1).

The reference p4661 I17 has been updated to:

Biavati, G., Feist, D. G., Gerbig, C., and Kretschmer, R.: Error estimation for localized signal properties: application to atmospheric mixing height retrievals, in preparation for Atmos. Meas. Tech., 2014.