Reply to Referee 2

Thanks a lot for these additional suggestions to improve the paper. You will find below the modifications we did accordingly.

1)   In relation to footnote 1 on page 2, if the authors have a suitable reference to justify that only raindrops larger than 10 um can be detected by UHF wind profiling radars, they should include it for completeness.

10um was underestimated. The boundary between cloud air and rain should be closer to 100um than to 10um. The rainfall detection threshold is determined by the value of radar reflectivity factor where the Rayleigh scattering from precipitation becomes stronger than the Bragg scattering from clear air (Ralph, 1995). It depends on the radar wavelength and at constant wavelength, it depends on the particles size. Cloud particles have too small reflectivity factors to be detected by UHFs.
According to Ralph (1995), if we consider a terminal velocity of the rain of 0.5 m/s, the raindrops size would be around 100um. 0.5 m/s is also the threshold in the Doppler power spectrum that allows to distinguish between the peak of clear air and the peak of Rayleigh scattering (assuming that the vertical velocity of the air is negligible).
We do not wish to include these details in the text, but we followed your suggestion and quoted Ralph (1995). And we replaced 10 um by 100 um.

2) In relation to equation 14 on page 5, I think that dV/dz should represent the vertical shear of the of the horizontal wind vector rather than of the horizontal wind speed. The authors have correctly used the former for equation 18, page 14.

You are totally right and we made the change p 5 and consequently p 14.

3) Use of the word "inversion" on line 8 of page 13 is confusing since it is applied to sharp negative gradients of specific humidity. Although the feature at 3000 m in Figure 3a does appear to correspond to a temperature inversion (the relevant part of the q-sat curve is obscured by the legend), the one at 4400 m in Figure 3c does not.

The word 'inversion' was not only confusing but also wrongly used: our aim was not to comment the temperature inversion but instead the sharp decrease of the moisture slope (these decreases were not necessary linked to temperature inversions). So we removed the word 'inversion' and replaced it by something more appropriate (throughout the whole paper).

4) In equations 1, 4, 5, 6, 8, and 12, as well as in the inline equation on line 15 of page 4, a multiplication sign should be used to separate the mantissa and exponent portions of the coefficients - e.g. in equation 1, 3.73 x 10^5 should be used instead of 3.73 10^5. I realise that there is a small gap between the two terms, but in most cases the gap is so small that the above reads as 3.7310^5.

We enlarged the gaps since we do not find that the alternative (use of character '\times' in Latex) would be nice. We hope it is clearer now.

5) line 15 of page 6. This is the first time that the abbreviation ABL has been used. It should be defined here rather than on page 7. Similarly, AGL should be defined on line 11 of page 7 and ASL on line 7 of page 11.

Done, thanks.

6) In the legend for Figure 5, it is difficult to distinguish between the shapes used for "lower layer" and "upper layer" owing to the pale green used to illustrated them.

We added an edge to the symbols, including those of the legend. The shapes are also described in the caption.