

Dear Stefan Kneifel,

I agree with you that even if no low elevation angles are used you can have to deal with mountain slope possible perturbation in the measurements. In that sense we could have inferred that temperature profiles are expected not to be affected even with 5.4° elevation angle measurements. Even though we could have concluded this just from the papers investigating IWV and snow, I think this is very indirect.

Thus I think it is still relevant to show these kind of studies specifically on temperature profiles.

And I do not totally agree that it does not matter if the valley is steep or not. In fact, if you are close to the mountain slope, with a not steep valley you can probably use lower elevation angles compared to a steep valley because in the steep valley you will be affected by the mountain even at 10 or 30° of elevation depending on the configuration.

This limits the places where you can deploy the instrument if you want good retrievals of temperature profiles with boundary layer scan. Not being able to use low elevation angles deteriorate the retrievals especially in the cases studied in the paper with very stable boundary layers. As we wanted to use all elevation angles, we could not deploy the instrument close to the city of Passy or Sallanches for example whereas it could have been more interesting than in the center of the valley.

Even though the papers you cite might show that we can expect no disturbance, I do not think from the results published we could have directly concluded that we can perform temperature profiles at the bottom of a valley using the lowest elevation angles.

From my point of view, the deployment the closest to our study is the one in Massaro et al 2015 and there is no mention to these UFS related papers.

I am sorry but I do not agree to say that I wrote that Kneifel et al 2009 only used 30° elevation angles. First of all nothing is mentioned in the manuscript with respect to the elevation angles except that the mountain elevation (which is not a big mountain) was smaller and only IWV was investigated which is true. Secondly in our answer to you I clearly mentioned that I noticed that elevation scans down to 5.4° degree are performed but the degradation in accuracy in the orography direction is not clearly investigated neither what accuracy in temperature we can expect from the free line of sight angles lower than 30° is mentioned. Thus, even though low elevation angles are performed, only based on the results of the paper, I am sorry but there is no proof that measurements below 30° of elevation angles are not affected by surrounding mountains and what accuracy I can expect in the temperature profiles in complex terrain.. There is no discussion and results about these low angles retrievals in the suggested papers.

Finally, showing that we can expect good temperature profiles at the bottom of a valley is only a tiny aspect of this paper as it deals with future data assimilation and modelling errors during stable conditions. Thus this paper is very different from the UFS studies except the complex terrain deployment and even in that sense both configurations are very different.