

We thank the anonymous reviewer for the positive feedback. Below we present the answers to the raised issues point by point.

1) A major concern that I have with this work is that the authors have failed to discriminate the impact of work with respect to previous contributions where STEPS was used. Sure the area of focus is different (Belgium in this case), but it would be nice if the authors could address this issue a bit further in the manuscript.

Thanks for the remark. A comparison of STEPS-BE and the original STEPS implementation is provided in Section 3.2. We will try to specify better what is the contribution of our paper w.r.t. the use of STEPS in other countries (e.g. UK, Australia, etc) and related publications.

2) Page 6846 lines 7-8 and Fig. 2 a,b: The authors mention here the impact of the bright band resulting in high rainfall rates around the radar. For the current example in Fig. 2 a,b the impact of hitting the bright band is rather smaller, as the forecasted accumulation is quite similar to the observed accumulation around the Zaventem radar. I get the feeling that this is mainly due to the relatively low horizontal velocity field of this event. I am wondering what the quality of the forecast is for larger lead times or for cases where the horizontal velocity is larger.

The bright band effect influences both the radar observations and the nowcasts based on their extrapolation. At longer lead times the local rainfall over-estimation due to the bright band is extrapolated far from the location of the radar. However, the stochastic perturbations of STEPS gradually damp this effect and reduce the amount of over-estimation. The bright band affects more the observations used for the verification, in particular when the rainfall is advected from upstream over the radar region. In such case, the forecast is detected as if it under-estimates the rainfall, which is not true. However, bright band effects might not be so important for urban hydrological applications. In fact, except for the two stratiform cases presented in this paper, pluvial floods mainly happen in summer with convective precipitation events, during which the bright band is absent or negligible.

3) In line with the previous remark, I was wondering whether the authors have opted to apply some kind of bright band correction method as the bright band is observed at relatively low elevation (500-2000) during the fall and winter season in Belgium (see Hazenberg et al., 2013). For this period of the year my expectation is that many CAPPI images are contaminated with the impact of the bright band and its impact will be extrapolated while running the STEPS-BE algorithm. As the precipitation intensities are overestimated within the bright band, these forecasts will lead to incorrect urban hydrological model simulations.

The correction for the bright band and for the vertical profile of reflectivity is only taken into account in a more advanced quantitative precipitation estimation (QPE) product. Unfortunately, this new product was not yet working in real-time when developing STEPS and it currently works only on single radars (there is no composite available yet, which significantly reduces the nowcast lead time).

4) Page 6850 lines 26-29 Another explanation ... Z-R relationship: Since all the Marshall-Palmer relationship was used to convert radar reflectivities into rainfall estimates, I do not understand why space time variations in Z-R lead to a higher under-dispersion at a lead times of 5 minutes. Please elaborate on this in the text.

We will add some sentences to better formulate this concept. The last observed rainfall field is extrapolated using a fixed Z-R relationship. The same Z-R relationship is used to convert the observed reflectivity to the rainfall rates that are used for the verification. However, spatial and temporal changes in the drop size distribution (DSD) can lead to changes in the estimated rainfall rate that is used for the verification. Therefore, there could be a mismatch between the "fixed" DSD of the forecasts and the variable DSD underlying the verifying observations.

Another possible source of mismatch could be due to the advection correction with optical flow. The forecast accumulations are computed by advecting forward the previous rainfall field. On the other hand, the observed accumulations are computed by reversing the optical flow vectors and advecting the rainfall field backwards. This choice increases the differences when comparing the +0-5 min forecast accumulations (advection of the "0" min image forward) with the +0-5 min observed accumulations a posteriori (advection of the "+5" min image backwards). We will add these details to the text.

- Page 6837 lines 1-2: Please add the elevation of the CAPPI.
The CAPPI is at 1500 m.a.s.l. We will specify it in text.

-Page 6843 lines 22-23: I would suggest to remove the line "Thus, a ... MPI implementations)."
We will remove this sentence.

-Page 6850 line 26: Add a "." after times.
Corrected.

References: Hazenberg, P., P.J.J.F. Torfs, H. Leijnse, G. Delrieu and R. Uijlenhoet, 2013: Identification and uncertainty estimation of vertical reflectivity profiles using a Lagrangian approach to support quantitative precipitation measurements by weather radar, J. Geophys. Res. Atm., 118(18), 10243-10261.