

## **General comments**

The paper entitled “Using nowcasting technique and data assimilation in a meteorological model to improve very short range hydrological forecasts” by Poletti et al., aims at exploiting both observations and modelling sources to improve the discharge prediction in small catchments with time horizon of 2-8 hours. In particular, observations are used in a frequently updated data assimilation framework to drive the NWP system, whose output is in turn used to improve the information in input to a nowcasting technique; finally, nowcasting and NWP outputs are blended, generating an ensemble of rainfall scenarios used to feed the hydrological 20model and produce a prediction in terms of streamflow.

The paper shows a good literal review, and it is quite well written and readable. However, I strongly suggest to check the punctuation marks which could be much improved.

The research is innovative and it fills into the aims of the paper. I found very interesting how the authors try to merge all observations, radar and NWP forecasts with the blending technique to obtain the best hydro-meteorological simulations. This could be encouraging in the scientific research, above all for flash floods forecast in small catchments as they are in the Liguria Region with a fast response to the rainfall input.

The abstract and conclusions are satisfactory, with scientific methods and assumptions valid and clearly outlined, but I recommend to take care about figures, since some improvements can be done, as above suggested.

## **Specific comments**

P6, L189: Please, can you clarify better the ensemble members introduced in this part of the text?

P7, L224-229: Less or more weights according to the forecast hours is a progressive gain as written in the text. Are they related to the different blending functions in Figure 4?

Figure 1: Please, highlight the Liguria border with a different colour.

Figure 2: Please, add “top” and “bottom” in the caption for the figure description.

Figures 6, 9, 10, 11: What is shown over the upper whisker of the coloured box plots?

Please, try to use a greater font for x/y-axis label and legends in the figures.

## **Technical corrections**

P2, L34: Add a comma, after (2016)

P3, L71: I suggest: “...and, hence, reduce...”

P3, L79: Add a comma, after (2013)

P3, L84-85: I suggest: “in order to better reproduce observations in terms of spatial and time location, on the one hand, and to improve QPF (Davalio et al., 2017a) on the other hand.”

P3, L89: Add “the” before NWP QPF.

P3, L99-102. Please clarify better this sentence. I suggest: “First, the blending is performed not only combining the rainfall fields forecast by the nowcasting and the NWP model in their spatial distribution as in more standard approaches (Kilambi and Zawadzki, 2005), but the nowcasting rainfall fields are modified along the forecast window according to the information related to the time variation of rainfall volume derived from the NWP model...”

P4, L111: Add a comma before “while”

P4, L113: I suggest: “The area of study is the Liguria Region, located in north-western Italy (Fig.1a) ...

P4, L122: “km<sup>2</sup>”

P4, L126: I suggest: “...all over the Liguria Region domain, but...”

P4, L128: I suggest: “of 2014: in particular, ...”

P4, L130: Add a comma before “while”.

P5, L164: I suggest: “evolves differently in the altered realizations,”

P6, L197: Please, check the acronym “PhaSt” how it written in the whole text. Please homogenize it.

P8, L254: Add a comma before “and” .  
P8, L255: “configurations”  
P11, L341: Add a comma after “In general”  
P11, L358: Add a comma before “instead”  
P11, L359: Add a comma before “while”  
P11, L361: Add a comma after “forecast”  
P12, L384: Add a comma after “explained”  
P13, L 430: please homogenize the Italian words in English as in the rest of the text.  
P13, L 432: Add “the” before Continuum  
P14, L440: Add a comma after “cases”  
P14, L446: “improvements”  
P14, L447: “techniques”  
P14, L448: Add a comma before “but”  
P14, L449: Add a comma before “further”

Captions of Figure 1: I suggest: “Area of interest: a) Location of the Radar in the Liguria Region and its covered area; b) BOLAM and MOLOCH (blue square) integration domains; c) the Liguria Region and the drained area of the analysed basins for the three events: the Polcevera and Bisagno, flowing inside the urban area of Genoa and the Graveglia, one of the main tributaries of the Entella basin, the biggest basin of Liguria Region”