Torrential rainfall in Valencia (Spain) recorded by personal weather stations preceding and during the 29 October 2024 floods

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Rev. B

Decision: Major revisions

General

This manuscript focuses on" quantify and describe the spatial and temporal structure of the rainfall event occurred on 29 October 2024 exceeding 300 mm within less than 24 h, that caused devastating floods in the province of Valencia in Spain. Using rainfall observations from approximately 225 personal weather stations (PWSs), low-cost commercial devices primarily operated by citizens. The network density of PWSs is ~7 times higher compared to the dedicated rain gauge network operated by the Spanish Meteorological Agency (AEMET) in the province of Valencia, allowing a more detailed analysis of the spatial and temporal rainfall dynamics. Overall, interesting study using low cost sensors' measurements to quantify the precip/flooding conditions. Although, scientifically interesting work, there are several limitations in the analysis and needs to be addressed before going to be published.

Major issues:

1. Needs to show precip rate measurements versus a pluvio/distrometer based measurements. Tipping Buckets have their own issues as you described here.
2. Please provide a comparison of two different data set obtained from different two sensors.
3. What are the averages of the observations used? Can you compare the 5 min measurements?
4. Ln 25; what is high level? 500 mb or 200 mb etc.
5. Fig. 3; what the blue circles, how averages are made? >30 mm/hr there are large errors at about 20 mm/hr. Do you have pluvio measurements? 94% relationship? Provide absolute difference between two sets using PR>30 mmhr-1
6. Fig 4; Better to show dPR between 2 measurements and plot against PR measurements.

7. Fig. 4; PR>50 mm/hr, PWS2 has values at about 20-25 mm/hr less than PWS1. 25-30% diffs.
8. Fig. 5c; second event value cant be located at the PA (accum precip); why is that?
9. Data Uncertainty; you need an independent instrument for this analysis; like pluvio or Distrometer.
10. Now, you have wind measurements, did you look at wind speed and directional effect on precip rate and amount?
11. In the calculations for flood volume, did you look at the mountain slope effect? Rather than only precip impact on flooding?

Overall, based on above issues and clarifications, this works needs major issues.