Atmospheric Measurement Techniques Discussions

Atmos. Meas. Tech. Discuss., referee comment RC2
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Comment on amt-2022-196

Anonymous Referee #2

Referee comment on "Estimation of raindrop size distribution and rain rate with infrared surveillance camera in dark conditions" by Jinwook Lee et al., Atmos. Meas. Tech. Discuss., https://doi.org/10.5194/amt-2022-196-RC2, 2022

Opportunistic sensing is an emerging crowdsensing technique for monitoring precipitation. Previous studies have suggested that delicate use of visual surveillance cameras allow the retrievals of rain drop size distributions as well as rainfall intensity. This study demonstrates that raindrop size distributions can be retrieved from an infrared surveillance camera as well. The topic is relevant for AMT readers, and the presented work is interesting. I have a few concerns as listed below.

- The motivation of using infrared surveillance cameras is weak to me. Although no such work has been done, it does not necessarily mean that the presented work is promising in applications. Given many readers are in the meteorology community, they may wonder: Are infrared surveillance cameras widely distributed? Why and how should this approach be applied? At what conditions should we employ this technique? The authors may elaborate this point in Introduction or in Discussions.
- It appears to me that the algorithm used in this study is similar with previous works on visual images. The authors should clearly state the innovative point of the presented algorithm. For example, how were the previous algorithms adapted to fit the infrared application?
- Fig. 7. Where are those big particles from? If they are falling, they should have rather high velocities. But they could also be the results of lens contamination.
- Fig. 8. Comparing the DSDs retrieved from the camera and PARSIVEL, It appears that the variation of DSDs is not well captured by the camera. In particular, significant overestimation has been found for large raindrops. The contributing factors should be discussed.
- Fig. 9. It appears that fitting a distribution to some extent alleviates the overestimation of large drop concentrations, have you tried to construct the DSD using the fitted distribution? I would expect improved results.
- Given the significant bias found for large raindrops, I believe the evaluation should be made for a heavy rainfall event. Otherwise, the story is incomplete.