

## ***Interactive comment on* “Spatial distribution of tracers for optical sensing of stream surface flow” by Alonso Pizarro et al.**

### **Anonymous Referee #2**

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The manuscript investigates on the seeding density role for image analysis algorithms (PTV and LSPIV) useful for surface velocity measurements. Moreover, authors propose a dimensionless index for evaluating performances of algorithms.

The topic is surely interesting and the manuscript is well organized and easy to follow.

In the last twenty years the attempt to use camera for estimating river surface velocity is becoming always more reliable and, in general, gauge-cams are promising instruments that soon will be widely adopted. However, there are still several bottlenecks that should be, and will be, soon solved either in the hardware and in the software behind this relatively new methodology. One of these, is the absence of benchmarks for evaluating and comparing performances of image analysis algorithms (PTV, LSPIV, OTV, etc.). This manuscript goes toward this direction providing a simple framework

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for analyzing the seeding density role. So, I positively evaluate the manuscript since, about this research topic, is not easy, or better impossible, to have available reliable benchmark, so the idea of synthetic scenarios is welcome.

Following this general assessment, I have some further comments to share with the authors.

Lines 30-35. I found reductive these lines for emphasizing the usefulness of non-contact approaches. Such approaches allow to measure surface velocities (and so indirectly discharge) during a flood, that is not possible to observe with common methods. So, it represents really a crucial and significant advancement of knowledge.

Lines 49-50. Maybe the difference between PTV and LSPIV could be better described referring to the “eulerian” and “lagrangian” characterization.

Line 51. Unfortunately, or fortunately, these are still not “widely” used.

Line 127. How discharge and velocities were estimated or measured?

Figure 4. I am very glad to see the figure 4 that clearly shows how the PTV outperforms LSPIV. It is a pity that authors (line 185) did not apply any post-processing on the results. Comparing PTVLab and PTVLab+post processing, results are significantly different, indeed the potentiality of PTV is in the opportunity in validating trajectories avoiding fake information. In any case, it is already clear from the results that PIV suffers more than PTV of the seeding density. Maybe the final percentage errors would be different for the two methods. I would mention in the conclusion or in the discussion that the difference between PTV and LSPIV is expected to be higher in case of using post processing analyses.

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