

## ***Interactive comment on “Fluorescent particle tracers for surface flow measurements: a proof of in a semi-natural hillslope” by F. Tauro et al.***

### **Anonymous Referee #1**

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#### General Comments

The authors present an interesting technique for monitoring overland flow velocity in the field. This is an important issue that needs to be addressed in order to improve the description of surface flow propagation across natural drainage systems. The proposed technique is original and potentially useful. There are, however, problems that ought to be solved in order to make the proposed technique really applicable. In addition, a stronger validation is needed. I feel that this paper makes a significant, new contribution in the area of hydrology, and I recommend therefore acceptance for publication in Hydrology and Earth System Sciences. A moderate revision is, however, needed to provide a more concise contribution focusing on motivations, strengths and

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weaknesses of the proposed measurement technique, as well as directions for future research.

### Specific Comments

Page 4466. The authors may want to provide a more concise introduction section by highlighting the methods currently in use for the determination of overland flow velocity and the potential strengths of the proposed measurement technique over these methods.

Page 4473. I feel that the calibration of the rainfall simulator (Appendix A) can be omitted. This is not a central part of the problem addressed in the manuscript.

Page 4474. A detailed discussion of the obtained results is provided here. I feel, however, that the largest audience would be rather captured by a more concise discussion written along the following lines:

– These are the strengths of the proposed technique. – These are, at present, the weaknesses of the proposed technique. – These are the directions to overcome the problems in future research.

Among the strengths of the proposed technique, one can envisage the monitoring of the velocity field inside a diffused overland flow. Among the weaknesses one can note the blocking produced by soil roughness and vegetation of particles, especially the largest ones. In addition, environmental compatibles materials have to be used.

Page 4478, line 29. The sentence “unreasonable flow velocity of 0.11 m/s” sounds a bit strange to me. The authors are proposing a measurement technique for overland flow velocity. This technique is expected to tell us how much the overland flow velocities occurring in the field are. It seems here that the operator’s feeling is used to validate the measurement technique. More in general, a more extensive validation of the proposed technique is needed. If the proposed technique has potential to be fully automated, a validation can perhaps be provided against flow velocity data obtained by current non-

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automated methods (tracers, etc.). The authors should at least acknowledge explicitly that a more extensive experimental evaluation is needed.

Page 4481. I really do not think that Appendix A is necessary here. Rainfall simulator issues are not central to the presented method for overland flow velocity measurement.

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