The authors want to thank the anonymous author for his/her comments on the manuscript as they tackled not only the hydrological aspects of our work but also the photogrammetry side. In the following we describe corrections to the manuscript and give comments to the reviewer's remarks:

R = Reviewers comment

A=Authors response

Anonymous Referee #1:

R: Some abbreviations are not explained properly (GSD, SD, RR,...).

A: An index of abbreviations was already included in the manuscript. The authors rate the given abbreviations as commonly used and would like to avoid additional definition of the terms in the manuscript.

R: Concerning methodology: SfM is definitely fine for high density DEMs, but is the model

scale appropriate?

A: The correct model scale was guaranteed by the total station measurements. A local coordinate system was set up and the reflectors served as ground control points for aligning and scaling the model.

R: There is no data on hydrology of the experiments in the paper, but ca 170 ml/sec at the width of 1m of the plot indicates very shallow flow depths?

A: Data on hydrology have been added to the manuscript (Tab. 1). 170 ml/sec are around 10 times the amount of other rainfall simulations and thus seemed appropriate with regard to the aim of the study to simulate surface runoff. A source with comparative data of other rainfall simulators has been added to the manuscript (Iserloh et al 2013).

R: Is the Manning equation appropriate with "classic" coefficients or is it a bit "out of purpose" (originally the approach was derived for rather big flows/depths)? This might be at least discussed in the introduction or methodology.

A: Reasons supporting the use of the manning equation have been added to the manuscript (2.2 discharge experiments) and a corresponding source was given (Emmett 1970).

R: Measuring Q at the outlet pipe may have suffer from serious time lags induced by concentration of the flow back to the pipe in such a precise experiment.

A: There is no flow back possible due to 1. The steep inclination of the pipe itself and 2. due to the shape of the water collector which leads flow to a rather large inlet of the pipe.

R: How the flow depth (for Manning's) was derived? Just by estimating from equation of continuity? I am afraid it seriously varied throughout the plot (in depressions, but also along the slope).

A: Yes flow depth was derived from continuity equation (sentence also added to the manuscript). We applied mean values out of eight transects along the plot measuring flow velocities repeatedly to produce closest approximations. Of course rill flow occurred in rather shallow rills and flow depth varied across the plot thus the equation of continuity seemed to fit best.

R: In some DEMs – the preferential flow was identified. The authors overcame this by extracting the realistic flow-paths from the DEM, but still very variable flow velocities do not support using sheet flow formulas (criteria).

A: To apply rillflow formulas, the morphology of the rill has to be known and would make the approach too complex. Since rillflow is working with very shallow flow depths on our plots, sheet flow formulas are still appropriate or at least the best approximation to use in our experiments.

R: The velocity was extracted by high-speed image recording – no data in the paper? How it was then averaged? Was the frontline integrated over the whole crosssection?

A: The frontline of the first tracer was integrated, not the frontline of the initial water flow after starting the experiment.

R: What is the measuring precision influence on the presented numbers?

A: We attached a sensitivity analysis.

R: Is the shallow flow valid explanation for the sigmoid curve dependence, or might this be other parameters – such as not easily recognizable flow velocities for rilling plots(preferential flows)?

A: Rilling occurs only in shallow rills with comparably wide cross sections. We tested the sensitivity of the flow velocity to see the impact of possible measuring mistakes and added the results to the manuscript. The rather high flow velocities on the steeper plots are less sensitive towards the Manning n than slower discharge.

R: How many repetitions were performed at the locations? The plot data (figure 6, 7) show very limited number of experiments? Is that one location or all?

A: Unfortunately, by now there are not more experiments than the ones presented here. Water supply was tedious on all locations which is why a laboratory setup could be recommendable but is to be constructed in near future. This weakness has been added to the conclusion.

R: The fluid density was considered different from water (based on sampling?) in the equation? Values not specified.

A: Density was considered 1000g/l as only in case of detachment analysis different densities would be required for sediment loaded runoff.

R: Interior orientation of the camera – was it easy to keep it unchanged – when using the zoom lens (even at end position of the zoom)? For F2.8 and close surface-camera distance I would suppose large areas out of focus?

A: The zoom was locked at 16 mm to keep conditions constant. A change in camera orientation can still be compensated by additional calibration (e.g. Agisoft Lens) at all applied focal lengths. The given f/2.8 represent the maximum aperture of the lens and is included in its product name. The applied f/stop (f/8.0 for large DOF) was now added to the manuscript.

R: The four tie-points, from the presented image they seem to be fixed very loosely – no problem with keeping them in position for the whole experiment?

A: The referee is right concerning the stability of the reflectors and possible issues. Nevertheless, the orange poles are stuck deep enough into the substrate and any contact was avoided. In two cases stones were used for additional support.

R: From the presented DSM image it looks that 1 mm DEM had to be already rather smoothened, any tests performed on the data precision necessity?

A: We tested the influence of the resolution and changes only occurred in the third decimal place [m], which is therefore negligible.