Editor decision, after minor revision (Submitted 27 Jan 2017):

The authors have replied to all the reviewers' comments in their rebuttal and made changes to the manuscript accordingly. However, some of the comments merit a more substantial and critical discussion than is currently provided.

The authors conclude that climatological variability contributes more to flow variability than spatial rainfall variability. This makes sense for the relatively small catchment they investigated, as 30 years of rainfall are likely to represent more variability than rainfall over a domain of only 77 ha (or less, the subcatchments are max 30 ha). Still, the results on spatial rainfall variability obtained in this study are strongly dependent on the choices that have been made in the rainfall downscaling procedure (see also comment nr2 by reviewer 2), since the original spatial scale of the rainfall data is larger than the catchment scale (2x2km). For example, it is assumed that the wet area ratio is always equal to one during storms (and zero in between storms), which strongly limits the degree of spatial variability that can occur. In reality, even if the scale of a storm is typically larger than a few km2, more and more zero rainfall pixels would occur within the storm domain as one scales down to smaller scales. The impact of the assumptions made for the downscaling procedure on the partitioning results should be more critically discussed.

Another point that requires more discussion is how the uncertainty of the model used in this study might influence the results (see also comment reviewer 2 regarding use of 10 minute temporal resolution). The authors refer to Tokarczyk et al. (2015) for information about model calibration. In this paper, Nash-Sutcliffe efficiency values of 0.70-0.75 were reported and simulated versus observed hydrograph results show relative errors in peak flow estimates of over 25%, for flows up to about 300 l/s. The range of flows that is analysed in the partitioning study is far outside this range (1000-3000 l/s), while variability associated with rainfall climatology and spatial variability is of the same order of magnitude as the model uncertainty (~25%).

A final point the authors could discuss more critically is the fact that they use data over a period of 30 years and draw conclusions for return periods up to 30 years. In particular, they conclude that the contribution of spatial rainfall variability becomes more important for larger return periods (> 10 years), but statistics beyond 10 years are quite unreliable for a 30 year time series, given the small sample sizes in the extreme tail of the statistical distribution.

A few comments with respect to the figures the authors have provided in the supplement to the paper:

- Figures S6 and S7: these are very insightful figures presenting the main results of the partitioning study. It is not clear why the authors have chosen to show results for location B, where flow is controlled by a throttle, in the main body of the paper, while they present results for locations A and C in the supplement. I would suggest to present and discuss all 3 figures in the main body of the paper.
- Figure S1: this figure presents parameters used for the spatial downscaling procedure, but the interpretation of the figure isn't entirely clear. In the caption: "For the case study, rainfall was generated over an area of 2.25 km2 using grid size of 100 m, thus a CV of 1.5 was used." Yet in the figure, the domain area seems to span 64-1024km2 (doesn't go down to 2.25 km2) and the grid size 2-16km. Where do we read the CV value of 1.5 for domain size 2.25 km2 and grid size 100m from the figure?