Dear Referee #1,
We are very grateful for your constructive review of our paper. We will try to take advantage of your advice for improving the manuscript.

General Comments
The paper deals with a very interesting topic based on the relationship between simulated river flows and rainfall interpolation procedures. Then, some recommendations to interpolate rainfall would be elucidated. Specifically when disperse rain gauges are available. But this is also a very difficult problem because of mixing so many uncertainties. At least those related with the suitability of rain gauge network to estimate rainfall maps, the goodness of multivariate procedures to interpolate rainfall and the parameterization of a distributed hydrological model. Furthermore, they focused on extreme events simulated with a daily continuous hydrological model which seems to be another difficult task. After reading the paper I would recommend a major revision of it because of: 1. There are so many techniques described that obscured what it may be their principal analysis: ". . . effect of different raingage densities and particularly the effect of the raingage positions for very sparse raingage data used for rainfall interpolation, on extreme flow". Note the ambitious of this study that encompasses rainfall interpolation, the analysis of rain gauge network, the use of a continuous hydrological model and the assessment of maximum discharges. 2. Conclusions aren't derived from a detailed analysis of results. My opinion is that the description of results is only descriptive of some specific simulations (scenarios) but causes aren't analyzed and authors don't offer clues to take into account in other basins 3. The complexity of the topic makes almost impossible to differentiate what is due to interpolation methodology and what is derived from hydrological modelling. Why the authors didn't use a cross validation technique to elucidate which are general recommendations for a multivariate interpolation procedure of rainfall in order to clarify their conclusions? 4. Main findings related to kriging are obscure and not directly useful. Authors remarked the importance of rain gauge position but they didn't offer insights of different rainfall samples and their representativeness of rainfall in each basin 5. An index is proposed to " . . . illustrate the quality of the raingage distribution with respect to the calculation of extreme discharge" but I found it that it wasn't properly described. Authors neither used a mathematical formula nor analyzed its sources of variability, i.e. its domain of values and their significance
We were trying to shorten the paper, that's why all methods are very briefly described but the references are precisely cited, if the readers need to know details about the methods. However, we will make clearer about the techniques details in the revised manuscript. We respond below to your scientific questions item by item:

Addressing scientific questions
Some scientific questions may be proposed to authors:
1. According to the use of multivariate methodologies, are there any sources of variability in rainfall and elevation relationships (temporal or spatially variation) that may affect parameterization of kriging and subsequently those methods compared?
We used the elevation information extracted from Digital Elevation Model (DEM) in order to improve the estimation by using the Kriging with an External Drift (KED) and Ordinary Cokriging (OCK). The KED used the elevations as the secondary variable to derive the local mean of rainfall (primary variable) while OCK took advantage of the correlation between the two variables (elevation and rainfall). Over the 30 yr (1976–2005), there were a total of 10063 rain days, on which the Pearson's coefficient was computed from the correlation between rainfall amount and elevation. Of these 10063 rain days, 2087 rain days (20.74 %) had a Pearson's correlation coefficient higher than 0.5 and 181 rain days (1.8 %) had a Pearson's correlation coefficient lower than −0.5. This analysis is already done and published in our previous paper (Ly et al 2011). We think that this analysis does not affect the parameterization of kriging.

2. What are the advantages of addressing the suitability of interpolation procedures by means of discharge extremes instead of using a cross validation procedure?
As stated in the manuscript, the evaluation of interpolation methods are frequently accomplished using cross validation approaches through evaluation of some statistics. However cross validation alone can not be compared on a like-for-like basis. Here, we proposed a better test of a rainfall interpolator for hydrological modelling that is to use their rainfall estimates as model input and to assess the modelled flows against observations. Moreover, we think that it is an innovative idea to compare by taking more attention on extreme discharge analysis.

3. Wouldn't be profitable to identify sources of uncertainty in your work?
We will try to address the sources of uncertainty in our revised manuscript.

4. There is an index proposed to describe how suitable is a rain gauge network for hydrological modelling. But it doesn't work with elevation or aspect values that it is recognized to influence rainfall. Wouldn't it be a major disadvantage to use the index proposed?

It is recognized that elevation and aspect have influence on rainfall. But the proposed index (our result confirm that) is one of the key factors to define the model's performance. We will discuss this point in the revised paper.

Technical corrections

â˘A ´c Whatever methodology is used or selected to interpolate rainfall, it can be objectively parameterized. No matter if it is deterministic or multivariate. Cross validation is a well know methodology that allows the estimation of errors and the optimization of interpolation procedures. â˘A ´c I would recommend to use only one term to refer ground rain gauges: rain gauge, raingages or weather station â˘A ´c Maximum elevation in analyzed basins is 693 m which can't represent high elevations. What is the variability of recorded rainfall? â˘A ´c Daily records of rainfall, are free of errors and gaps?. â˘A ´c â˘A ´c The removing of outlier discharge is based on annual maximum daily analysis. As stated in the paper, outliers are also due to natural causes. So, their removal is an open question that can be discussed. I also wonder how the removal of such kind of data can affect to a continuous hydrological modeling â˘A ´c How rainfall scenarios are designed and why are based on the selection of 70, 8 and 4 rain gauges. The same question for the positions. How are they selected? â˘A´c Can't see rain gauge positions in Figure 3 â˘A ´c Figure 4 is not clear because of line thickness â˘A ´c Wouldn't be useful to express mathematically the index used to describe the performance of the rain gauges in a basin?. And then, what are usual values, over what range would you say that rain gauge network is suitable for hydrological modelling, what are the criteria to select rain gauges to work with. How can we refer this index
Typing errors
General Recommendation: review of English Line 30, page 2: "serveral"Â °u Line 2,
page 3: "simuated"Â°u

We thank you very much for technical corrections that help us to improve our paper. We will address the parameters that we use in the interpolation methods. Please refer to answer #2 for the issue of cross validation.

We will revise the terms that refers to ground raingages.

The rainfall varied according to the elevation as explained in the answer # 1. A basic rainfall error detection is already included in our algorithms and the rainfall data itself have usually gaps, missing data that we did not consider in the calculation.

We made an outlier test based on Rao and Hamed, 2000 for the simulated discharge for the statistics of extreme, so it does not affect to the continuous hydrological modeling.

The rainfall scenarios are design based on available raingages (70) in and surrounding the catchment. Then we reduce the number of raingages and the raingages are randomly chosen.

Figure 3 and 4 is pretty clear according to the file, maybe it is because of printing problem, and anyway we will improve it.

We will put more information on index of position to make the results more understandable. We will recommend the range of the index. According to our results, we can say that the index below 1.5 is suitable for hydrological modelling.

We will improve English of the manuscript.

References:

Ly, S., Charles, C., and Degre, A.: Geostatistical interpolation of daily rainfall at catchment 556 scale: the use of several variogram models in the Ourthe and Ambleve catchments, Belgium, 557 Hydrol Earth Syst Sc, 15, 2259-2274, 10.5194/hess-15-2259-2011, 2011.

Rao, A. R., and Hamed, K. H.: Flood frequency analysis, 1st ed., CRC Press, Florida, 376 pp., 570 2000.