Interactive comment on:
Extracting statistical parameters of extreme precipitation from a NWP model
by J. Eliasson et al. : T. Johannesson (Referee) tj@vedur.is

Authors' response to referees comments

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1 General comment

This is an interesting paper. The results are considerably better than I would have expected beforehand for an 8x8 km grid. They have considerable practical value and indicate a line for further work that could be even more interesting.

> *Response*
> The good agreement is contrary to what the authors expected. Systematic errors were expected to show up to a degree that made it necessary to apply some kind of a spatially varying correction function to the simulated M5's. The authors would like to thank the referee for his valuable comments.

2 Specific comments

1. The authors might mention earlier in the paper that they are using uncorrected station precipitation. A sentence could be added regarding the likelihood that corrections would make much of a difference for annual maximum daily values. The recent work of Crochet on correction of precipitation measurements in Iceland might be referenced.

> *Response*: following sentence added
>
> The basic data for the M5 is the uncorrected annual maximum 24h precipitation. Various of correction methods do exist (Crochet (2007)) but these can be applied to the values on the map by the users as the corrections apply to varying wind speeds in the range 0 - 6,5 m/s but annual maximum rains in Iceland usually occur in storms with wind speeds larger than 6,5 m/s, but above this wind speed the correction factors depend on rain intensity only. The reliability of the correction factors is also an open question in rain intensities larger than 60 - 80 mm/24h.

2. What are the 1990 and 2006 data sets? Explain better.

> *Response*: sentence changed to the following
>
> Another way of assessing the stability in estimated M5 values is to study the differences between a short and a longer period in many points. Figure 4 shows how the differences in M5 values estimated from station observations covering the periods up to 1990 (Eliasson, 1997) and 2006 respectively. There is a minimum of 20 years behind each M5 value so the data sets of each station overlap by an amount of years that depends upon the period of operation of that station. The difference in M5 is within 10 mm but depends strongly on the number of station years. Above 60 station years this difference seems to be within 5 mm. The average value of the difference is 1 mm but the standard deviation is 3.6 mm. It therefore seems appropriate to assume that the M5 values estimated at the meteorological stations are within ±4 mm for each location. This indicates that the stability of the M5 estimates is good enough so

observed and simulated values can be compared, even though the observation periods of the individual stations do not cover exactly the same time period as the simulation.

3. The comparison between M5 values derived from the 1990 and 2006 data sets on p. 4868 needs to be explained better. Are the periods partly overlapping? This would lead to smaller differences than for mutually exclusive periods.

Response: See response to comment no 2

4. Is “standard error” the correct term to use for RMS of differences? There are “errors” in both the stations M5 and the simulated M5 values. Their difference is not “error”, but an RMS value can be computed.

Response
RMS is the correct term. The RMS is there because there are errors in both the stations M5 and the simulated M5 values. The term standard error refers to the "standard error of the estimate" sometimes used in comparing model results to the values fed to the model as "true" values. Here it complicates the matter that both values are products of the same statistical model applied to observed and simulated values so there are no "true" values.

5. Is it correct to call the half of the 63% interquantile range an “RMS standard error” as done in table 3?

Response
We think so, not all the model results are used so standard error of the estimate is not appropriate. See response to comment 4.

6. Figures 5 and 7 need to be improved. Some figures indicate zero precipitation over the ocean. Figure captions of these and other figures might be expanded to explain symbols and other aspects of the figures that are not self-explanatory.

Response

7. Figure 8 can be omitted.

Response
Deleted

8. It might be interesting to show an xy-scatterplot of annual maxima for several stations with long series of measurements (MM5 versus station values). A xy-plot of M5 values derived from these data could then also be shown. This could serve as the basis for slightly more discussion about how the random distribution of the annual maximum values is reduced when the statistical M5 parameter is calculated.

Response
New Figure 8, with discussion added