**Response to referee #3**

The manuscript assesses the representation of the extreme precipitation by the convection-permitting-scale dynamically downscaled regional climate model COSMO-CLM, driven by ERA-Interim reanalysis. The focus of the study lies on the reproducibility of the "reverse orographic effect" consisting of a decrease of short-duration extreme precipitation with the increase of the elevation in the complex-orography context of northeastern Italy. To limit drawbacks in terms of underrepresented climate variability within the short temporal segment of 10 years considered and related large uncertainty on the estimation return period longer than the available period, Authors take advantage of the Simplified Metastatistical Extreme Value (SMEV). This approach relies on the assumption that a suitable statistical model describing the ordinary events may be identified and related distribution can be used to define the distribution of yearly maxima and to capture the probability of occurrence of extremes. Uncertainties are characterized using a bootstrapping method and sources of bias from rain gauges located at different elevations have been taken into account.

The manuscript is overall well written, and results regarding the adoption of the statistical SMEV approach and physical mechanisms behind the presented results (i.e., subgrid processes behind the model underestimation of the reverse orographic effect) have been comprehensively presented and properly discussed.

Authors' response: We thank the reviewer for the positive feedback and the provided comments/corrections. We address them in the following. We numbered each comment as R3Cx (Referee 3, Comment x), and our response is indicated with "R" and blue color. In the proposed modifications to the original text, we indicate the new text in *Italics*.

It follows only minor comments.

R3C1. Line 45: CPMs instead of CMPs.

R: We will correct the mistake.

R3C2. Line 60: Please correct the doubled reference.

R: The references Poschlod et al. 2021 and Poschlod 2021 refer to two different papers.

R3C3. Lines 205-207: This statement is not supported by evidence. Please provide a real demonstration through some plots in defense of the applicability of Weibull tail approximation to the right distribution tail of ordinary events of your datasets.

R: We include below here an example of how the Weibull tails fit the observed data, but we need to point out that we disagree with this evaluation. We tested whether the H0 hypothesis of having Weibull tails can be rejected by the available observations. To do so, we used long rain gauge records and we checked whether the observed annual maxima could be likely samples from Weibull tails estimated explicitly censoring the observed annual maxima themselves (censoring their magnitude and retaining their weight in probability). Such an approach provides outcomes that are more robust than a visual evaluation of the goodness of fit.
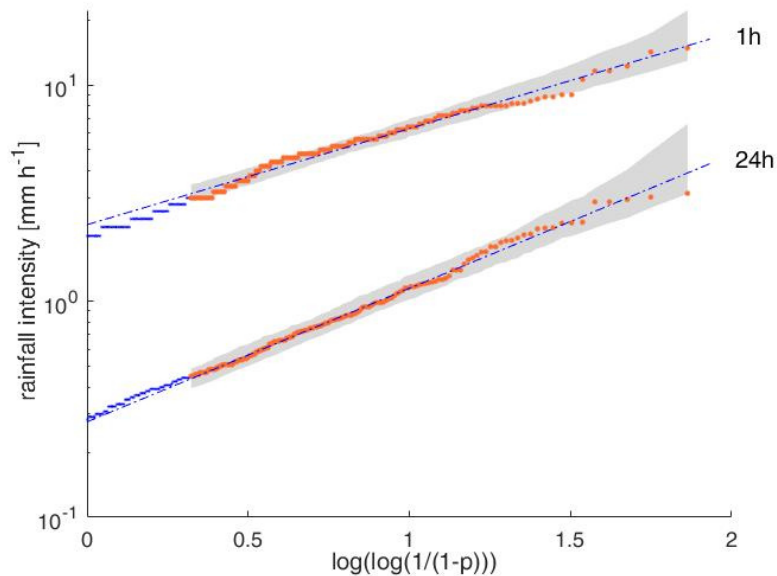
The figure shows an example of Weibull fit of the tail of ordinary events for one station, two different durations (1h and 24h), and a left-censoring threshold of 0.75. Points represent all the ordinary events, orange points represent the events used for the Weibull fit (here the top 25%). The dashed lines indicate the Weibull distribution fitting the data, and the shaded areas indicate the 90% Weibull sampling uncertainty, obtained with a bootstrap procedure. On the x-axis, p represents the non-exceedance probability. If the portion of annual maxima outside the shaded area is more than 10%, the hypothesis of Weibull tail is rejected, for the tested left-censoring threshold.

R3C4. Lines 214-215: Please better introduce this section.

R: We will modify the introduction to the section as follow: "*Extreme return levels are estimated using* the SMEV statistical model ~~is applied using the approach~~ as described in Marra et al. (2020) [...]"

R3C5. Line 252: Correct the numbering of the section.

R: Thank you for pointing it out, we will correct the numbering.

R3C6. Line 348: "The slopes test significantly different at the 5% level." Not clear what "different" is referring to.

R: We will specify: "The SC_CPM slope is significantly different (5% significance level) from the OB slope ".

R3C7. Why place subsections 5.1 and 5.2 in the discussion section and not in the results section?

R: Thank you for this suggestion, we will place the two subsections in the results section.

R3C8. Figures 4 and 6 it quite challenging distinguishing green and blue markers.

R: In the legend, we correct the color for SC_CPM (it was green by mistake).