

## ***Interactive comment on* “Extreme events in total ozone over Arosa – Part 1: Application of extreme value theory” by H. E. Rieder et al.**

### **Anonymous Referee #2**

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The authors are right in assuming that I have not read the supplement. I apologize for failing to recognize this change which was introduced after the quick review.

However, the data presented in this supplement and the interactive comments do not change my opinion that thresholds for ELOs and EHOs depend strongly enough on the selected reference period to invalidate the conclusions drawn in the study.

I thank the authors for adding Table 1 and Fig. 1 in the attachment of their interactive comments and for calculating the average factor of 1.4. Regardless of diverging understandings of the term "weakly" we can argue with these numbers. Referring again to page 12776, lines 16-19, of the manuscript, I rewrite the statement:

"This shows that thresholds for ELOs and EHOs depend (only) by a factor of 0.7 com-

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pared to the mean values on the selected period, so changes in the frequency of ELOs and EHOs cannot be attributed to a particular choice of reference period."

A factor of 0.7 is not small enough to justify the conclusion in the second half of the sentence!

The authors argue that the same message ("weakly" dependence) is visible in the data presented in the supplement of the manuscript, ie. Figs. S2 and S3. In Fig. S2 I suppose to see similar factors as stated above. The authors have added data for many additional time periods. However, one important time period is still missing, ie. the one with low ozone: 1990-2008! Why?

The authors put forward good reasons not to detrend their data set before further analyses and not to use different sub periods. However, this does not allow to draw automatically the converse argument that valid results comes out of a study without detrending or using less sub periods. Sometimes one has to admit that a data set is not good enough to retrieve the desired conclusions. In my opinion, this is here the case, with so much decadal variability, which cannot be addressed adequately by using the selected time periods.

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Interactive comment on Atmos. Chem. Phys. Discuss., 10, 12765, 2010.

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