**Natural Hazards
and Earth System
Sciences**

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Discussions

Interactive comment on "Brief Communication: Statistical detection and modeling of the over-dispersion of winter storm occurrence" *by* M. Raschke

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Dear Joaquim G. Pinto,

thank you very much for your comments and all your effort regarding my brief communication. Here is my reply.

Major Comments:

a) Natural hazard and risk strongly corresponds with randomness. Randomness is described and analyzed by models and methods of statistics and stochastic. Hence, a reader of a journal about natural hazard should understand well statistical issues.

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That is why I do not think that my brief communication is too statistical. Of course, a technical paper is written technical.

b) I can add a few more sentences in the introduction. However, it is a brief communication about a technical issue.

c) My brief communication deals with statistical aspects, not meteorological mechanism. There is no necessity to repeat the explanations of Karremann et al. (2014).

d) I have checked section 3 and do not see any possibility to explain the mathematical deviation in an easier way.

e) As I stated in the brief communication, the over-dispersion is well detected with my approach. This includes that the distribution for return level >=1 year differs from the Poisson distribution. Of course, the statistical model selection has to be understood. I will offer more references for the reader.

f) I will add a sentence and clearly name the objective of the brief communication in the introduction and add a sentence in the conclusions on the achievement of the objective.

g) Most parts of the paper have been/were checked by a professional editor.

Specific comments:

1) I will correct the spellings.

2a) An over fitted regression model results in an underestimated residual variance what can lead to the false interpretation of under-dispersion.

2b) The exact definition of the storm magnitude in the data example is without relevance for the statistical methods and models explained in my brief communication.

3a) There is no misunderstanding but there is an inconsistence in the application of term "return level" by Karreman et al (2014; compare Tab.1 with Fig.3). I do not discuss this.

3b) Once more: the reader of a journal about natural hazard should understand statistical issues.

4) AIC and BIC are very popular in statistics. I will add further references. The issue is that there is too little correct and appropriate statistical analysis and models in many researches (of natural hazards).

5) AIC and BIC have to be understood for understanding the sentence. No further phrase is needed. Maybe I change the initial sentences a bit.

Kind regards, Mathias Raschke

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