

## ***Interactive comment on “A copula-based assessment of Bartlett–Lewis type of rainfall models for preserving drought statistics” by M. T. Pham et al.***

### **Anonymous Referee #2**

Received and published: 30 July 2013

The manuscript is particularly interesting since provides an evaluation of five Bartlett–Lewis models analyzing some bivariate properties of Severity and Duration. I like the approach to assess rainfall simulator not only looking to general statistics but to detailed information related to the possible use of synthetic time series.

The manuscript is generally well written and pleasant to read, so I am glad to suggest to accept it for publication.

I agree with all of the comments of Guillame Evin and I have some other suggestions listed in the following.

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Title. I agree that the title should refer more on the particular assessment than the on copula use.

page 7471 line 23. Maybe, here, I would avoid to cite paper more applied oriented (like Shiau 2006, Shiau and Modarres 2009, Vanderberghe et al., 2011).

page 7471 line 26. I would start a new paragraph with “This study aims....”.

page 7473 line 10. The reference Onof et al. 2013 (mentioned several times in the text) is not present in the reference list, or maybe in the list is 2012.

page 7473 lines 10-25. I had some problems in the visualization of parameter symbols.

page 7475 lines 14-21. This paragraph could be removed since it repeats something already mentioned in the Introduction.

page 7476 line 17. A physical explanation of Effective Precipitation could help the reader.

page 7476 line 23. Equation 1 and all the equations seem to have some problems in the format, maybe it is my computer problem.

page 7477 lines 9-14. these lines are unclear and can be improved.

page 7477 lines 19-21. As before, maybe a more touchable explanation of EDI could help the reader.

page 7478 line 3. Please include in the text the reference Morid et al., 2006 (as done in the Table)

page 7478 lines 12-25. These lines can be reduced since the content is already present in the Introduction.

page 7480 line 15. Maybe the reference on multivariate return period review “ Gräler et al. 2013” could be added.

page 7481 line 9. The 5.1 section title could be improved.

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page 7482 line 15. It seems to me a “qualitative” and not a “quantitative assessment”.

page 7485-7486 lines 21 - 15. The RMSE and the GoF tests should be included in the section 4.1 and not in the results section.

page 7487 lines 1-3. Maybe yet the differences in the GoF tests are an evidence of the imperfect performance of rainfall simulator.

## References

In the following I will list the first author of references present in the list but not mentioned in the text:

Bogner

Engida

Glasbey

Gyasi-Agyei

Gyasi-Agyei

Khaliq

Marani

Pui

Smithers

Velghe

## Figures and Tables

In Table 2 there are some problem in the equation format

In Table 3 it could be better explained what are Autocovariance (to which lag is referred?) and ZDP (that is not explained). “3rd Moment” is not so elegant.

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Figure 4, 5, 6, and 7. The comparison plot could be more effective using other scales  
Reference included in this review: Gräler, B., van den Berg, M. J., Vandenberghe, S., Petroselli, A., Grimaldi, S., De Baets, B., and Verhoest, N. E. C.: Multivariate return periods in hydrology: a critical and practical review focusing on synthetic design hydrograph estimation, *Hydrol. Earth Syst. Sci.*, 17, 1281-1296, doi:10.5194/hess-17-1281-2013, 2013.

Interactive comment on *Hydrol. Earth Syst. Sci. Discuss.*, 10, 7469, 2013.

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