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Hydrology and Earth System Sciences Discussions

Interactive comment on "Technical Note: A significance test for data-sparse zones in scatter plots" *by* V. V. Vetrova and W. E. Bardsley

Anonymous Referee #3

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This paper is an extension of the method proposed in the paper by Barsley et al. (1999) to test for sparse zones in scatter plots. Although the method might prove to be a useful tool for hydrologist, I think the paper cannot be published as is.

I fully agree agree with R. Hulf's comment in that the paper needs extra explanations. As is, it is not possible to understand how the test is performed. The author claim that, compared to the test of Barsley et al. (1999), the new test can now cope with sparse zones containing a single point. However, as the theory of the test is not presented (or at least too briefly), I don't understand what differs between the two tests.

More specifically:

- I don't understand what is $\Delta(m)$: is it an area (as stated p. 1337 l. 20), or is it a

  proportion of area (as in p. 1338 l. 1)?
- I don't understand how the random swapping is performed in the test.
- How is p (the p-value of the test) computed from $\Delta(m)$? This is not cleary explained so far.
- I wonder if Fig. 2 is a very good example since the case $m = 0$ is tested, which was already possible with the earlier test of Barsley et al. (1999).
- I'm not sure to understand p. 1339 l. 7–8: "the autumn forecasting model has value for forecasting some future low inflows". Do you conclude this because the black line is close to he 1:1 line for low inflow (and because of the test)?
- Regarding the spring inflow forecast: according to me (if I understood things correctly), even if the p-value would have been small, the black line is anyway to far from the 1:1 line to say that low inflows can be correctly predicted, so the conclusion that "there is no confirmed predictive ability for spring inflows" seems not to be a conclusion from the test itself.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 9, 1335, 2012.