**Hydrology and
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Interactive comment on "Climatology of daily rainfall semivariance in The Netherlands" *by* C. Z. van de Beek et al.

Anonymous Referee #3

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The manuscript focus on the climatological variability of the semivariance of daily rainfall data from 33 stations in the Netherlands in order to produce "a simple equation to estimate the daily rainfall variogram as a function of the time of year ".

I have several reservations regarding the analysis carried in this manuscript and its exposition. In particular, I find the overall quality of the paper to be poor. A lot of unnecessary information is thrown to the reader, while the presented analysis lack rigor. Most notably a detailed and rigorous analysis of the limitation and applicability of the proposed methodology is missing. For example in the abstract the Authors say "This climatological semivariance can be employed to estimate the accuracy of the rainfall input to a hydrological model even with only few gauges in a given catchment area", but I did not find any such analysis in the manuscript. Another example is in the

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conclusions were they state "Year-to-year variations of the fitted spherical variogram parameters have been shown to exist, but they are found to be limited. On average, the simple cosine parameterizations of the variogram sill and range have been shown to perform well. ". Of course variations exists and they are limited, could be it otherwise? Perform well? According to which metric defining "well"?

I do not recommend this paper for publication. Hereby is a more detailed list of what I consider to be the main limitations of this manuscript.

Major Issues

1)2088: lines 12-13. "The goal of this study is to produce a simple equation to estimate the daily rainfall variogram as a function of the time of year ". Actually, the Authors present an equation for the 90 days moving average and present any analysis regarding the fluctuations of the value registered on one particular day with respect the 90 days average. Moreover they do not care to communicate to the reader if they consider the values of the variogram parameters on one particular day (e.g. April 18th) as represented by 90 days moving average centered on the particular day or else (e.g the day is the left border of the 90 days window?)

2)2090: lines 5-8. "Assuming stationarity and isotropy of the rainfall field, which is not an unreasonable assumption on the daily scale". Do the Authors have some convincing evidences supporting this statement? If yes, please supply these evidences. I am not aware of any such evidences. Did the Authors verify (in the limits of the available statistics) that the variogram $\gamma(x,y)$ is indeed dependent only on the difference x-y (stationarity) and that it is also isotropic? The lack of such analysis makes me feel that "reasonable" means actually "convenient" since stationarity and isotropy allows the description of the rain field by two parameters (range and sill of the function $\gamma(h)$) instead of 528 variogram values (one for each couple of locations). Moreover, even if one assume stationarity and isotropy for convenience, an analysis of the deviation from this condition should be made in order to assess the "accuracy" of this approximation.

3)2093: lines 13-17 It is impossible to see the 40 days delay with the scale used in Fig. 3. What is the significance of this delay? Is it important for the conclusion of manuscript? I think this part could be dropped. Otherwise add figure and text to explain better this part.

4)2094: lines 15-16 As the previous point, it is impossible to see with resolution of Fig 4a. An additional figure would be necessary to show the variability of the annual minimum and maximum over the 30 years.

5)2095-2096-2097 The application of the sqrt-sqrt transformation is completely arbitrary (why this and not another one). What is really accomplished? Figure 6 (units of x-axis are missing) does not convey any message to me.

6)2097: lines 21-25. The explanation of the "approximate" 6 months periodicity of Fig. 9A is unsatisfactory. Yes in Fig. 7B the "peak of the climatological fit is slightly later in the year and lower than the actual fit", and "the minimum in this figure the climatological fit actually comes earlier". So what? It does not automatically implies the occurrence of a 6 months periodicity.

7)2097: lines 25-end and 2098: lines1-3. Is this discussion necessary? What accomplishes?

8)Short range analysis: I think this entire section could be omitted as it is not clear how general the results relative to this case-study (March 2004 – March 2005) are.

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