

Referee report on a revision of *A pseudoproxy assessment of why climate field reconstruction methods perform the way they do in time and space*, by Yun, Smerdon, Li, and Zhang.

Overall Comments: As much as I like the topic of this paper, I don't find the revision to be much more informative than the original. The typos are now gone, but new issues arise and the authors still delegate many important matters to citations. I am a statistician, trying to learn how to conduct these tests, and this paper is incredibly vague. I could not reproduce any of the results from what is given in the paper. I do not want to see another version of this. Maybe some of my troubles lie with the Copernicus' journal's editorial process, but it is frustrating to see virtually the same paper again.

Specific Comments:

1. I am still unclear how the hypotheses are tested. I believe that the authors are getting p -values from some sort of self normalization procedure, but this is never made clear. I previously thought that they were coming from the chi-squared distribution, but now I doubt this (lines 259 and circa 275). But if true, doesn't self normalization need to be discussed? Since I am unfamiliar with this technique, what hope do climate scientists have? This is my frustration with the paper: I do not know why we are doing what is being done.
2. At the centre of the tests, I still don't understand why we are projecting onto eigenfunctions. If I want to test whether the mean is the same from two samples at a fixed site, I look at the difference between the univariate averages — univariate asymptotic normality comes up. If we want to examine all sites in \mathcal{D} simultaneously, a vector of mean differences arise and multivariate asymptotic normality arises. The authors provide some words on this, but hardly anything swaying.
3. There still isn't anything that I see in the paper that tests for both equality of means and autocovariances simultaneously.
4. Section 2.2 seems new, but its notation is bad! First, you are denoting variants of quantities with a prime, and mixing this in equations where T denotes transpose. Compounding this, you have a variable named T ! Matrices and vectors are not bolded. There are quantities like P^r related to P' (why suppress the prime?). It took me an hour to deconvolve this simple section!
5. Grammatically, the paper is pretty good. Nonetheless, there are a few spots where articles are abused or there is awkwardness. For one such example, the first line in the abstract should probably start with "This paper derives". And spatiotemporal really still needs a dash to be Oxford compliant.
6. I apologize for being so picky, but your paper seems like a black-box for climate scientists to follow rather than something informative.