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Interactive comment on “Late quaternary temperature variability described as abrupt transitions on a $1/f$ noise background” by M. Rypdal and K. Rypdal

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First of all I would to thank the author and both reviewers for bringing us this interesting subject. We are witnessing diverging points of view that may partly pertain to the nature of the objectives followed in this manuscript. The authors propose that a $1/f$ process is an adequate noise background model, over which specific modes of variability are superimposed. This includes Dansgaard-Oeschger variability. According to this rationale, such modes of variability need to be subtracted prior to characterisation of the noise. Reviewer S. Lovejoy replicates that the whole thing has to be viewed as the realisation of a multifractal processes that features intermittency. The very notion

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of adding signals is an implicit reference to a quasi-Gaussian framework that would be invalid here. This reviewer also expresses doubt about whether a CWT is appropriate for estimating spectral slopes in this context. In between, Ditlevsen makes a number of relevant technical observations, not least about the definition of H (see also Lovejoy's comment), and formulates a request to clarify the methods by which a 'trend' can be identified and possibly subtracted (the authors speak of trends that can be or not 'real', which needs to be expressed more carefully).

I can see the following course of action as a possible path towards resolution.

The first task of the authors would be to review and reply to the technical points raised by Ditlevsen. If there is, indeed, an error in the definition of H then authors need to think about how this impinges on the rest of the manuscript. Ditlevsen also provides a case for the relevance of Orstein-Uhlenbeck processes to describe interannual variability that needs to be examined.

If the authors believe that they can address these points adequately, then they need to clarify their line of defence against the arguments of Lovejoy, specifically whether 'intermittency' behaviours can be isolated in an adequate statistical model. They will also need to address the possible problems (or not) raised by the use of a CWT to estimate spectral slopes.

Interactive comment on Earth Syst. Dynam. Discuss., 6, 2323, 2015.

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