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Interactive comment on "A Methodology for Attributing the Role of Climate Change in Extreme Events: A Global Spectrally Nudged Storyline" *by* Linda van Garderen et al.

Anonymous Referee #2

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This paper proposes a new methodology based on global spectral nudging to perform extreme event attribution conditional to dynamical conditions, as part of a storyline approach of attribution. This method is applied to two case studies : the 2003 European heatwave and the 2010 Russian heatwave. I find the paper very clear and interesting and just have a few minor questions and comments for the authors that I list below.

l.57-59 I get your point about type 1 and type 2 error because I have read Lloyd and Oreskes' paper. However, I feel that this sentence does not fit very well in this paragraph and will be very confusing for someone who has not read the paper. I would delete the sentence or move it elsewhere and develop it a bit more.

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l.205 Why did you choose a three years spin-up? How do you know this is enough?

l.209 Is there a reason behind the choice of three runs? Do you have any idea whether the results would be different if you added more runs? I understand that it takes computational time to add more runs for a global model but if you could comment on this (maybe as a limit of your study), the number of runs would look more justified.

l.213 Could you add a reference for this statement? I know you comment on this later in the paper, but I think you should put the reference here first.

l.266 to 279 I find this whole paragraph very interesting and original. Do you have an interpretation to explain the spatial variability of the differences between factual and counterfactual simulations?

l.311-313 that's an interesting interpretation. Do you have a reference about the direct radiative effect of GHG?

l.334 You could link that statement to the results presented in Hauser, M., Orth, R., and Seneviratne, S. I. (2016), Role of soil moisture versus recent climate change for the 2010 heat wave in western Russia, Geophys. Res. Lett., 43, 2819– 2826, doi:10.1002/2016GL068036.

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