

Interactive comment on “An efficient method for discerning climate-relevant sensitivities in atmospheric general circulation models” by H. Wan et al.

Anonymous Referee #3

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The authors proposed a strategy of using ensembles of shorter simulations to explore the responses of "fast physics" in GCMs to perturbations. It was shown that the ensembles of shorter simulations are able to produce results comparable to what is produced by traditional serial-in-time multiple-year GCM simulations, but at a fraction of the computational cost. The effectiveness of this strategy was demonstrated through two examples. One example showed the cloud and precipitation sensitivity to model time step. The other example examined the sensitivity of the TOA radiation balance to microphysics and aerosol related empirical parameters. The results of this study are useful to model development and evaluation community. The manuscript is well-written and easy to understand. I recommend the manuscript be published. Specific com-

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ments: 1. On P.2177, lines 8-9 "Shallow convection is parameterized as in Bretherton and Park (2009)"; lines 13-15 "The vertical transport of heat, ... is represented following the work of Park and Bretherton (2009)"; These two references should be swapped. 2. On P.2179, line 25, there is a typo. "simulaitions" should be "simulations".

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