Comment on npg-2021-26

Anonymous Referee #1

Referee comment on "Direct Bayesian model reduction of smaller scale convective activity conditioned on large scale dynamics" by Robert Polzin et al., Nonlin. Processes Geophys. Discuss., https://doi.org/10.5194/npg-2021-26-RC1, 2021

Review of "Direct Bayesian model reduction of smaller scale convective activity conditioned on large scale dynamics" by Polzin et al.

Recommendation: minor revisions

This study develops a stochastic model for up- and downdrafts based on the large-scale circulation. This stochastic model is potentially useful for convection parameterization schemes. This is a nice study and should be considered for publication.

1) The study uses the Direct Bayesian Model Reduction method. However, I did not get the impression that a Bayesian approach has been taken since the parameters have been estimated using maximum likelihood. Perhaps I have missed where the Bayesian aspect is coming in. Can the authors explain this in more detail.

2) Eq. (12): Why don't you use the standard "w" for the vertical velocity?

3) The authors should check the citation format. For example, "In (Kirkpatrick et al., 2009)" should read "In Kirkpatrick et al. (2009)".

4) Can the authors comment on how they plan to deal with uncertainties and biases in vertical velocity for parameterizations. The vertical velocity can be hard to measure and is likely biased in reanalysis and model data.

5) Line 194: Correct "Tab. ??."