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Interactive comment

Interactive comment on "Bayesian deconstruction of climate sensitivity estimates using simple models: implicit priors, and the confusion of the inverse" *by* James Annan and Julia Hargreaves

James Annan and Julia Hargreaves

jdannan@blueskiesresearch.org.uk

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Thank you for your comments. Our specific responses are given below.

Major comment:

Regarding code availability: yes we will make code available. Probably the easiest solution would be to provide the (commented) code that generates the figures. This code is simple and short (written in the language R with few external packages) and hopefully can accompany the paper as supplementary information rather than in a separate repository. We will consult with the Editor concerning this.

[Printer-friendly version]

[Discussion paper]

Minor comments.

The abstract will be rewritten.

Last line on page 2: where does the 0.5 come from?

0.5 is twice the standard deviation of observational error in this example (0.25) which will be made clearer.

In equation 2, what part of that is the "prior"? in fact, the term "prior" doesn't seem to be defined anywhere in the paper, which seems to me to be an oversight.

$p(x_T)$ is the prior which will be made explicit

Top of page 8: I would add a sentence here making explicit what you're doing: you're trying to back out what prior you'd need to get the same answer from a Bayesian analysis as you do from the naïve PDF sampling.

Agreed

In e.g., Eq. 7, the authors re-arrange the equation so that delta T is on the LHS. Why is that done? It seems important, but I'm a bit lost.

Using this arrangement, all terms on the RHS are already known/defined (in distribution) so we can conveniently generate the corresponding prior predictive distribution for ΔT and use Bayes' Theorem to update this using the likelihood for ΔT.

Sect. 3.3.1: I am quite confused what's going on here. I think what they're doing is taking lambda from Forster and Gregory and then using a Bayesian analysis to convert that to a value of S. Is that right? I think that they could add just a few words to make this more clear.

Yes, agreed