

***Interactive comment on “Comment on “Using multiple observationally-based constraints to estimate climate sensitivity” by J. D. Annan and J. C. Hargreaves, Geophys. Res. Lett., 33, L06704, doi:10.1029/2005GL025259, 2006” by S. V. Henriksson et al.***

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We are grateful for the authors presenting a calculation which in our view illustrates the robustness of our result. In order to even approach the ranges that earlier authors have generated, they have had to completely ignore one line of evidence (even though several papers, cited in AH06, have shown that it provides a useful constraint), and significantly weaken another. We noted in our original paper that it might in principle be

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possible to generate such a broad result, but that this seemed to require unreasonable assumptions (Section 4 of AH06).

While the authors claim that our LGM analysis was superficial, it was based substantially on the summary of the peer-reviewed literature presented in the IPCC AR4, which was still in draft form at that time and therefore is not directly cited. Henriksson et al provide no support for their change to this constraint. In fact, a recent review paper (Kohler et al 2009) considered this issue in rather more detail than we were able to do, and arrived at a 5-95% range for the equilibrium sensitivity of 1.4–5.2C considering the LGM alone. This is substantially narrower than the constraint we used, the difference arising in large part due to the wide temperature range which we used for LGM cooling, which we clearly flagged as pessimistic in our paper (note that the useful analysis of Schneider von Deimling et al 2006 was not published at that time). If the Kohler et al LGM result was taken in combination with the other evidence, which we believe is now widely acknowledged as the correct procedure, it would actually strengthen the main result of AH06.

We also appear to have reached agreement that subsequent research reinforces our main result.

#### References:

P. Kohler et al, "What caused Earth's temperature variations during the last 800,000 years? Data-based evidence on radiative forcing and constraints on climate sensitivity", *Quaternary Science Reviews*, 2009

T. Schneider von Deimling et al, "How cold was the Last Glacial Maximum?" *GRL*, V. 33, L14709, doi:10.1029/2006GL026484, 2006

Interactive comment on *Clim. Past Discuss.*, 5, 2343, 2009.

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