

Interactive comment on “Estimate of climate sensitivity from carbonate microfossils dated near the Eocene-Oligocene global cooling” by M. W. Asten

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We demonstrate that the uncertainties in climate sensitivity (CS) quoted in the submitted paper (Eqn. 6) do not match the quoted uncertainties in the source data (Eqns 4, 5). In addition, it is not entirely clear what the quoted uncertainties represent for S1 and S2.

Assuming flat distributions for S1 and S2, and normal distributions for ΔpCO_2 and ΔT_{global} , and using a Monte-Carlo simulation, Fig. 1 shows the distribution of consistent climate sensitivities, which does not match the quoted uncertainties in the paper. In particular, the distribution of CS is skewed and the tail of high CS is apparent in the

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Monte-Carlo simulation, but not in the paper.

We suggest that the author clarifies what uncertainties in S1 and S2 have been assumed, and to correctly quote the 5-95% confidence intervals in derived climate sensitivity using a similar Monte-Carlo approach. An additional figure showing the probability distribution for CS would be very beneficial.

We also have strong reservations that a single location can be used to derive any sensible estimate for global climate sensitivity, and this large caveat needs to be acknowledged far more clearly.

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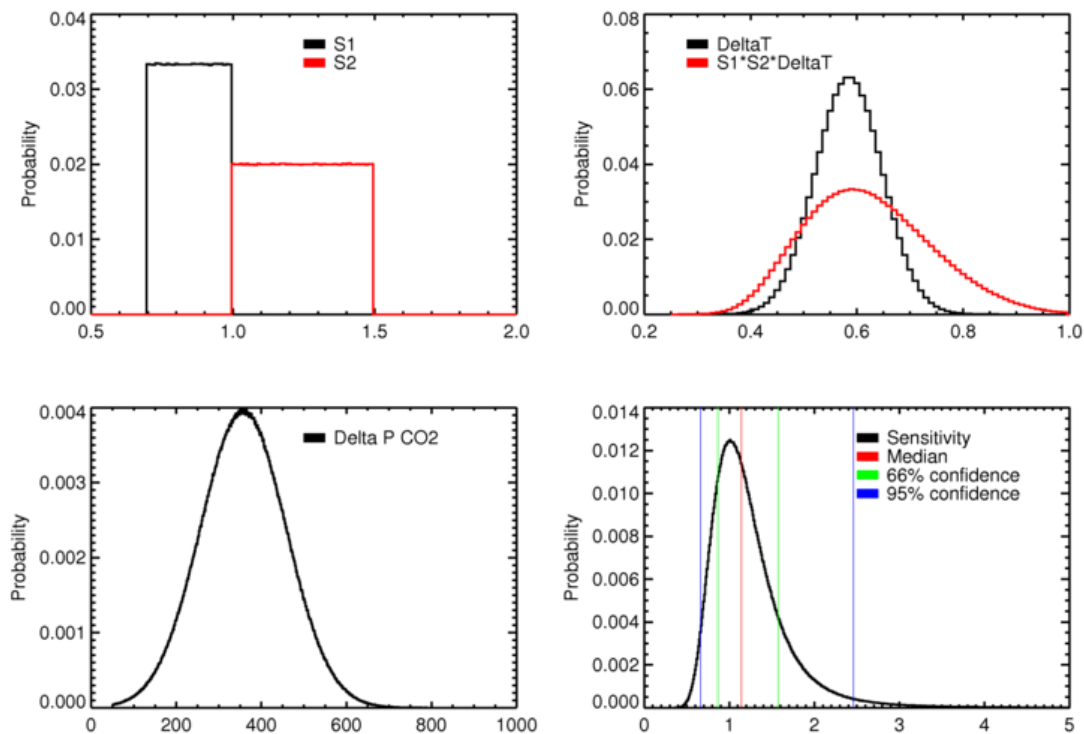
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Fig. 1. Monte-carlo simulation of uncertainties in climate sensitivity (bottom right), when using assumed uncertainty distributions for quoted components of the calculation.

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