

Interactive comment on “Dangerous human-made interference with climate: a GISS modelE study” by J. Hansen et al.

Anonymous Referee #1

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1. This is an interesting article that will likely stimulate discussions. On one hand, I am not a supporter of terms like “dangerous anthropogenic interference”, “disruptive climate effects”, “tipping points” etc. because they are difficult to define. On the other hand, the authors use these terms cautiously and I do not have strong counter-arguments other than personal preference.

2. Section 2 frankly accounts for model deficiencies. However, it is difficult to evaluate their importance for the presented results, especially regarding the aspects for which the model performs poorer than average (p.12556, l.21). On p. 12557 uncertainties are given for the climate forcings, and something similar is needed for the model uncertainties. This is partly covered by discussing climate sensitivity (mean temperature response to CO₂ doubling). A discussion about the model ability to simulate water

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cycle changes, e.g. precipitation distributions and intensities, would strengthen the manuscript.

3. The discussion focuses on global and regional changes in surface temperature. Even though this may be good indicator of climate change, it may not be best for “dangerous anthropogenic interference”. Ecosystems, wildlife and humans (e.g. agriculture) are more sensitive to changes in the water cycle and weather extremes (droughts, storms, floodings) than to mean temperature. If such changes are assumed to be associated with 5-10 sigma changes of seasonal temperature (p. 12563), this should be mentioned explicitly, preferably supported by references. I recommend a brief account of climate change indicators and motivate the emphasis on surface temperature.

4. In the section Tropical climate change (4.2.2), the focus is on the Atlantic Ocean. Please rename the section into Tropical Atlantic climate change. Alternatively, it would be interesting to learn more about typhoons. In this section you could refer to Trenberth K. E., D. J. Shea (2006), Atlantic hurricanes and natural variability in 2005, *Geophys. Res. Lett.*, 33, L12704, doi:10.1029/2006GL026894.

5. The summary (notably section 6.2) includes statements not directly derived from the presented climate simulations. Although it is not prohibited to express personal opinions, I would like to see a more transparent subdivision into scientific conclusions and personal inferences. It would help if section 6.2 starts by indicating that policy consequences and recommendations are being formulated. I propose adding a few sentences to the introduction (wrt sect 6) to inform the readers about the intent to interpret the climate simulations in terms of policy options and stimulate the discussion about the role of scientists in the climate debate.

6. Although section 6 presents a commendable effort to the question of how much global warming is dangerous, it is not really answered. I propose adding a brief summary of the criteria at the onset of sect. 6.2.

7. The last paragraph of section 6.2 should be presented under a subheading, e.g.,

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“Role of scientists in the climate debate”. It would be nice if some of the statements by Mr. Al Gore, as presented on the 2006 AGU Fall Meeting, could be referred to because they are highly relevant for this manuscript.

Interactive comment on Atmos. Chem. Phys. Discuss., 6, 12549, 2006.

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