

Interactive comment on “Earth’s energy imbalance and implications” by J. Hansen et al.

Anonymous Referee #2

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This is an excellent paper that should be published subject to addressing the minor concerns below. It is a tour de force of the response of the climate system to external forcing, the sensitivity of the actual system and of climate models, and a plea for better observations of the climate system.

The paper needs to address the following issues:

- p. 27032, line 3: change to “sun” to “Sun,” which is a name and needs to be capitalized
- p. 27032, line 18 – p. 27033, line 2: This is well-known and not new research, and so should not be in the abstract.
- p. 27033, lines 13-25: This is well-known and not new research, and so should not be in the abstract.
- p. 27034, line 5: Should mention that anthropogenic changes in land use and land

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cover are important regionally and on long-time scales, but for the past century are not as important as atmospheric composition.

- p. 27035, lines 7-8: This is cute, but not appropriate for a scientific paper. Remove references to grandchildren here and in figure.
- p. 27036, line 20: “slow feedbacks are surface albedo” This needs to be explained, as above you just said snow and ice are fast feedbacks.
- p. 27036, line 20: “whiteness” [double quotes always, except quotes inside quotes, in American English]
- p. 27040, line 10: The Green’s function curve should be green. It is unnecessarily confusing to make it red and the climate model green.
- p. 27040, line 17: Spell with tildes: “El Niño/La Niña” here and in rest of paper.
- p. 27042, lines 14-15: “Conceivably volcanic aerosols affect atmospheric temperatures in a way that induces El Ninos (Handler, 1986),” This idea has been completely discredited. Handler even had El Niños start before eruptions.
- p. 27046, line 8: insert space between 2.0 and W
- p. 27050, lines 6-7: link is broken
- p. 27060, line 4: change to “noise” with double quotes like you used above for the same word. In American English, single quotes are only for quotes inside quotes.
- p. 27061, line 10: same for “efficacy”
- p. 27061, line 16: You used the old SRES IPCC scenarios. Instead, or in addition. use the new RCP scenarios, so that the curves can be compared for modern climate model results.
- p. 27061, line 24: The currently accepted value is 1360.7 W m⁻². It would help to mention this, but that it will not affect these results as it is the changes that matter.

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- p. 27063, line 8: correct spelling to Soufrière
- p. 27065, line 12: “magnified by a factor 10” Then the axes are labeled incorrectly, as they are the same for the other panels.
- p. 27083, lines 13-14: link is broken
- p. 27088: Last lines of Fig. 1 caption: link is broken
- p. 27095: Last lines of Fig. 8 caption: change “is” to “are”
- p. 27105: Indicate what a-g are in figure caption.

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 27031, 2011.

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