

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

Anonymous Referee #2

Received and published: 31 October 2011

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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