

Interactive comment on “On the decadal increase in the tropical mean outgoing longwave radiation for the period 1984–2000” by D. Hatzidimitriou et al.

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Decadal Longwave Flux Changes

This paper is a very useful contribution to the discussion on decadal variability of clouds and radiation. The breakdown of changes implied from cloud properties (ISCCP), temperature and humidity (NCEP) are particularly useful. I have only minor comments to help clarification of the results.

1) Are the cloud fraction changes (given in % units) done as a relative fraction or absolute? For example, if tropical cirrus fraction is 0.20 cloud cover (absolute), and a decadal trend of 0.02 in cirrus cloud fraction, this is sometimes referred to as a 2%

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trend and sometimes as a 10% (0.02/0.20) trend. To eliminate this ambiguity in a variable like cloud fraction, I would suggest using units of fraction: i.e. a trend of 0.02 +/- 0.005.

2) Use of linear regression to measure trends is a bit dicey with the large 1991-1993 Pinatubo eruption and the 1998 El Nino signals embedded in the record. This was noted in the Wielicki et al. 2002 Science paper and the decadal changes were isolated by using the 1994 through 1997 period (avoiding the 98 ElNino, and Pinatubo 91-93 effect) for the 90s average, and comparing to the 1985 through 1989 period as the 80s. This would be a cleaner way to do Table 1. Perhaps both versions of Table 1 could be given: one from regression and one from 94-97 minus 85-89.

3) In section 5.3 the NCEP data set shows no significant trend in surface skin temperature. I believe, however, that this data set uses Reynolds SST values, and that these have a change of about 0.15C from 85-89 vs 94-97. Is the problem the large Pinatubo and El Nino signals? This might roughly negate the 0.23 W/m² drop in TOA OLR from stratospheric cooling.

4.) In section 1, the quote of the Wielicki et al. supplemental material in Science appears to be in error. That material indicates a HIRS trend of +1 W/m² instead of the value of 2 quoted in the text.

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