

Interactive comment on “Western Europe is warming much faster than expected” by G. J. van Oldenborgh et al.

Anonymous Referee #2

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General comments

The authors discuss observed temperature trends in Western Europe as they can be analyzed from two existing datasets CRUTEM3 and HadSST2. They do compare the observed trends with simulated ones, using climate experiments from state of the art global climate models. The analysis shows that the simulated trends for the time period 1950 to 2007 are weaker than the observed ones, which can not be explained by fast weather fluctuations or decadal variability. They state that depending on the season and region the discrepancies are influenced by deficiencies in the models related to the atmospheric circulations, a misrepresentation of the North Atlantic Current and soil moisture feedbacks. The authors conclude that these deficiencies might also influence climate projections, leading to an underestimation of the expected temperature rise for

Western Europe. The comparison of the simulated and observed temperature trends is a very interesting and important topic, relevant for many applications.

The paper is well written, with a clear structure, figures and the appropriate length.

Specific comments

Data: The analysis has been done on results of an ensemble of climate simulations from different GCMs, which cover a subset of the IPCC CMIP3 models, which have been selected according to a circulation index. It would be very interesting to expand the analyzes to all IPCC models, so that well known biases in summer could not influence the results so strongly.

Different gridded datasets have been used. Please clarify the abbreviations: only CRUTEM3 and HadSST2 are introduced with references, but you are also referring to HadCRUT3, which needs explanation.

Trend definition: The trends are calculated for 1950 to 2007. The GCMs only assume observed GHG/aerosols until 2000. From 2000 onwards the A1B emissions are used. Today we know that the actual emissions are larger than the A1B assumed once, so that the observed trends in the last years cannot be simulated correctly. Please discuss this issue and the influence on your conclusions.

Observed and modelled trends: In Fig 1a you are using station observations of De Bilt, which are representative for a specific surrounding. Please discuss the difficulty in comparing station data to grid box values for GCMs and the influence on your conclusions. A comparison of the De Bilt observations to the once from the HadSST2/CRUTEM3 dataset for the grid box representing the Netherlands would be helpful.

Please include the HadSST2/CRUTEM3 data in figure 1, too.

Interactive comment on Clim. Past Discuss., 4, 897, 2008.

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Interactive Discussion

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