



## **Recent global temperature trends: What do they tell us about anthropogenic climate change?**

J. Marotzke

Max Planck Institute for Meteorology, The Ocean in the Earth System, Hamburg, Germany  
(jochem.marotzke@mpimet.mpg.de)

Observations suggest a hiatus in global surface temperature rise since 1998, whereas most climate models simulate continued warming. What causes this difference? Do climate models respond too sensitively to the increase in greenhouse-gas concentrations such as that of CO<sub>2</sub>, and thus overestimate climate change systematically? Or has the discrepancy arisen by chance? And what is the relevance of this discrepancy for our assessment of long-term anthropogenic climate change?

In my presentation I will first illustrate the physically fundamental manifestation of anthropogenic climate change: the ocean's heat content increases because of the greenhouse effect from rising greenhouse-gas concentrations. This increase in heat content has gone on unabated for at least the past forty years. Then I will show that differences between different model simulations – and hence also differences between simulations and observations – are dominated by chance events if we consider temperature changes over periods as short as fifteen years. By contrast, it matters little whether models respond more or less sensitively to increasing greenhouse-gas concentrations, if we only consider changes over fifteen years. The difference between simulated and observed global surface temperature changes during the hiatus period thus tells us very little about model capability or lack thereof, and as an indicator of anthropogenic climate change the surface-warming hiatus is largely irrelevant.