



The response of El Nino to global warming in climate model simulations

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The impact of global warming on the dynamics of El Nino is examined in an ensemble of simulations with version 3 of the Hadley Centre climate model. The ensemble is generated by perturbing parameters in both the atmospheric and oceanic components of the model, in order to sample a wide range of global climate feedbacks. El Nino in experiments with fixed pre-industrial values of greenhouse gases and other forcing agents is sensitive to variations in both atmosphere and ocean model parameters and the ensemble exhibits a range of different amplitudes and frequencies. The mechanisms for these differences can be traced to variations in low cloud cover which are also responsible for variations in global climate sensitivity across the ensemble.

Under increased levels of greenhouse gases, all model versions shown in enhancement of the amplitude and frequency of El Nino events in a globally warmer world. The reasons for these robust changes are examined and the results are contrasted with other climate change experiments performed as part of the EU FP6 DYNAMITE project.