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Cloud feedback analysis in PMIP2 experiments

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A series of mid-Holocene (6,000 years ago) and Last Glacial Maximum (21,000 years ago) were performed with different atmosphere-ocean circulation models in the framework of the PMIP2 project. This presentation discusses the patterns and global means of the cloud feedback in these experiments. Diagnosis of cloud feedback is made with a method for approximating shortwave partial radiative perturbations.

It is shown that with the exception of one model, the shortwave cloud feedback has the same sign in a glacial experiment as in a $2\times CO_2$ experiment. Furthermore, the responses of clouds to a glacial and $2\times CO_2$ experiment are fairly symmetric, espec ially in the Eastern Pacific and in the Southern Ocean. There is, in these regions, more similarity between the responses exhibited by a particular model to glacial and $2\times CO_2$ forcings, than between the responses calculated by the different models to a same forcing. In contrast, regions where intense deep convection occurs, especially those associated with active monsoon dynamics, tend to present asymmetric behaviours between glacial and $2\times CO_2$ forcings.