



Multicentury oscillation of the North Atlantic Thermohaline Circulation in a partially coupled AOGCM experiment

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A multicentury (about 400 years) oscillation of the North Atlantic meridional overturning circulation (MOC) is simulated in a partially coupled experiment with the climate model ECHAM5/MPI-OM, where tropical Pacific sea surface temperatures (SSTs) were prescribed to climatology. The oscillation is not damped during the model experiment duration (1000 years) and is accompanied with corresponding salinity changes. Fresh water and wind stress forcing in the experiment do not exhibit multicentury variability. Thus the MOC oscillation is likely to be an internal oceanic mode excited by the transition to a new mean climatic state in the North Atlantic with reduced salinities. The missing interaction with the tropical Pacific seems to be important for maintaining the oscillation. Other partially coupled experiments with climatological SSTs in Atlantic or Indian oceans do not simulate significant changes in the MOC variability. The results imply an important role of the tropical Pacific variability for controlling the regime state of the North Atlantic climate and demonstrate an existence of the long-term internal oceanic oscillation mode.