

The influence of the AMOC variability on the atmosphere in CCSM4

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Abstract

The influence of the variability of the Atlantic meridional overturning circulation (AMOC) on the atmospheric circulation is investigated in 500 yr of a control simulation with the NCAR Community Climate System Model 4. The AMOC variability, which is largely driven by the NAO, significantly influences the atmosphere during winter. The winter response to an AMOC intensification at 30°N has some similarity with a negative phase of the NAO, and it is best seen after a delay of 6 to 9 years when the SST footprint of the AMOC shows a strong warming in the subpolar gyre and a weaker cooling in the subtropical gyre. The links to the air-sea interactions at the seasonal scale and their comparison with the observations suggest that the air-sea coupling in the cold season is more realistic in CCSM4 than in CCSM3. The impact of the AMOC and its SST footprint on the atmosphere during summer will also be discussed.