



## **The origin of the North Atlantic cooling**

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This study aims at investigating possible causes of the North Atlantic cooling with the MPI ESM 1.1 model. The cooling in the North Atlantic has been associated with a weakening Atlantic Meridional Overturning Circulation (AMOC) and an increased aerosol forcing or a combination of both. However, a weakening of the AMOC is hard to identify due to a lack of observational data from the ocean and deriving the AMOC strength solely from sea surface temperatures holds uncertainties. Consequently, in this study the long term changes of all vertical heat and radiation fluxes into the ocean surface as well as heat fluxes resulting from ocean circulation are to be calculated for the relevant area. This will be achieved by analysing a 100 ensemble member run of the MPI ESM 1.1 with historical forcing, as well as a 68 ensemble member run with 1pct CO<sub>2</sub> forcing. The historical runs are able to replicate the structure and amplitude of the cooling area on average while also showing some variability within the ensemble members.