



## **Multidecadal variability of the MOC and its influence on the atmosphere in the IPSL model**

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The influence of the natural multidecadal variability of the Atlantic meridional overturning circulation (MOC) on climate is investigated using a 500 year control simulation of the IPSL-CM4 coupled model. The low-frequency fluctuations of the MOC are mostly sensitive to deep convection in the subpolar gyre, which occurs South of Iceland in the model and is primarily forced by the advection of salinity anomalies driven by the East Atlantic Pattern. The North Atlantic Oscillation plays a secondary role in the model. During summer, the MOC variability is shown to have a significant impact on the atmosphere in the North Atlantic - European sector. This influence is due to an interhemispheric Sea Surface Temperature (SST) anomaly pattern with opposite signs in the two hemispheres but largest amplitude in the north. This mode corresponds to the model Atlantic Multidecadal Oscillation (AMO) and bears some similarity with the observed one. The atmospheric response is such that it induces a weak positive feedback on the MOC. The seasonal dependence of this response is discussed based on sensitivity experiments using the atmospheric component of the climate model coupled to a slab mixed-layer ocean model.