



## **On the existence of a potential multidecadal AMOC-AMO-NAO feedback loop in MIROC**

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Atlantic Multidecadal Oscillation (AMO) is a low frequency fluctuation of sea surface temperature (SST) over the North Atlantic basin with wide-ranging impacts on a global scale. A synthesis of previous studies suggests that there possibly exists a multidecadal feedback loop among AMO, Atlantic Meridional Overturning Circulation (AMOC), and North Atlantic Oscillation (NAO). In this work, we investigate the existence and the mechanisms of this potential multidecadal feedback loop among AMOC, AMO and NAO with use of two versions of a state-of-the-art climate model: MIROC5 and MIROC6. Identifying this potential multidecadal feedback loop could entail important implications for potential predictability of the multidecadal climate phenomena, as well as for isolating the impacts of the anthropogenic warming from those of the natural variability. Our preliminary results indicate that the updated version of the model, MIROC6, with a high-top and a shallow convection scheme, better exhibits the tropical part of the AMO-associated SST pattern, which is commonly underrepresented in climate models. Furthermore, MIROC6 displays a coherent relationship among AMO, AMOC, and NAO within the model, with its lead-lag relationship of each link being consistent with the previous observational and modelling studies. A particular focus will be placed on how the multidecadal NAO variability is induced in association with the AMO from an atmospheric dynamical point of view.