

EGU22-9433

<https://doi.org/10.5194/egusphere-egu22-9433>

EGU General Assembly 2022

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



AMOC response to Perturbations in Wind and Buoyancy Forcing in the Subpolar North Atlantic

Margarita Markina¹, Helen Johnson¹, and David Marshall²

¹Department of Earth Sciences, University of Oxford, Oxford, United Kingdom

²Department of Physics, University of Oxford, Oxford, United Kingdom

Atlantic Meridional Overturning Circulation (AMOC) is an important component of climate system and understanding what governs its variability is essential for improving climate predictability. Recent observational studies show large variability of overturning circulation in the subpolar latitudes with the dominant role of the eastern subpolar gyre, while the role of the wind and buoyancy forcing over the different regions remains underpinned. In this work, we use high-resolution (1/12°) targeted sensitivity experiments with the regional configuration of MITgcm for the North Atlantic. We show that our control experiment with repeated year forcing represents the major oceanic circulation patterns reasonably well and demonstrates similar strength of overturning with observational data from the OSNAP program. We investigate the oceanic response to changes in atmospheric forcing by setting the perturbations in surface momentum and buoyancy fluxes corresponding to the strong positive and negative phases of North Atlantic Oscillation.