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Exploring AMOC Dynamics: density vs. traditional z frameworks

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This study investigates the variability of Atlantic Meridional Overturning Circulation (AMOC) using both density and traditional z frameworks in the AWI-CM climate model. By prioritizing the density framework, we aim to understand which water mass transformations cause the AMOC change. These transformations are seen as diapycnal velocities through given isopycnal surfaces, and their geographical distribution provides a clearer understanding of AMOC dynamics. Our findings demonstrate that the AMOC responds to fast (annual or faster) fluctuations in atmospheric forcing associated with the NAO. In contrast, the connection between AMOC and deep water production south of Greenland is identified for slower fluctuations and remains consistent across both frameworks.

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