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Deep Atlantic Multidecadal Variability

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Investigating deep-sea temperature variability is essential for understanding deep-sea variability and its profound impacts on climate. The first mode in the Atlantic is referred to as Deep Atlantic Multidecadal Variability (DAMV), characterized by a north-south dipole pattern in the mid-high latitudes with a quasi-period of 20-50 years. The DAMV and Atlantic Multidecadal Variability, despite a statistical discrepancy, may be different responses to ocean heat transport (OHT) driven by the Atlantic Meridional Overturning Circulation (AMOC) at distinct depths separately. The relationship between the DAMV and the AMOC is established, indicating the AMOC is likely to transport surface heat downwards by deep convection and contribute to such dipole pattern in the deep Atlantic. Furthermore, meridional OHT proves the AMOC can explain the DAMV variation as a dynamic driver. These results reinforce the importance of deep-sea studies concerning the Atlantic climate system.