



Response of North Atlantic Ocean Chlorophyll a to the Change of Atlantic Meridional Overturning Circulation

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Changes in marine phytoplankton are a vital component in global carbon cycling. Despite this far-reaching importance, the variable trend in phytoplankton and its response to climate variability remain unclear. This work presents the spatiotemporal evolution of the chlorophyll a trend in the North Atlantic Ocean by using merged ocean color products for the period 1997-2016. We find a dipole pattern between the subpolar gyre and the Gulf Stream path, and chlorophyll a trend signal propagated along the opposite direction of the North Atlantic Current. Such a dipole pattern and opposite propagation of chlorophyll a signal are consistent with the recent distinctive signature of the slowdown of the Atlantic Meridional Overturning Circulation (AMOC). It is suggested that the spatiotemporal evolution of chlorophyll a during the two most recent decades is a part of the multidecadal variation and regulated by AMOC, which could be used as an indicator of AMOC variations.