Geophysical Research Abstracts
Vol. 19, EGU2017-1619, 2017
EGU General Assembly 2017

Atlantic Water transformation in the Nordic Seas and its influence on the export rate of the Overflow Waters

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The Nordic Seas (NS) are the main gateway between the Arctic and the Atlantic Oceans. The basin can be considered as the headwaters for the Meridional Overturning Circulation (MOC), for it is there that the Denmark Strait Overflow Water (DSOW) and the Iceland-Scotland Overflow Water (ISOW) acquire their properties. Their inflow into the North Atlantic Ocean occurs across the Greenland-Scotland ridge. Together with Labrador Sea Water, DSOW and ISOW are the main components of the North Atlantic Deep Water (NADW), which ventilates the lower limb of the Atlantic MOC. In spite recent studies exploring the export rate and later pathways of the overflows, the question about what drives them, remains. Here we explore the transformation of the Atlantic Water (AW) as it enters the NS through Denmark Strait, Iceland Faroe Ridge and Faroe Schotland Channel, as well as its pathways within the basin. To do so, we use an eddy-permitting ocean general circulation model run over the period 2002 to 2015. Two different approaches are used to track the AW transformation in the NS: the well-tested off-line Lagrangian tool ARIANE and on-line passive tracers. In both cases we use the same definition of AW to tag its inflow through the three entering sections. The overflows directly impact circulation and water properties in much of the deep Atlantic Ocean, thus a better understanding of the physical processes behind their variability is crucial a asset.