



Impact of overflow variations on the gyre and overturning circulation

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Variations in the overflows across the Greenland Scotland Ridge on the one hand and of deep-water formation in the Labrador Sea (LS) on the other hand, are assumed to modulate the strength of the Atlantic Meridional Overturning Circulation (AMOC). Recent publications have given different emphasis on one or the other. Long control experiments and sensitivity runs have been carried out using the coupled AOGCM ECHAM5/MPIOM and the response of the AMOC to deep-water formation variations is analyzed. Changes in overflow transport and density leave their imprint on the MOC and can be traced far to the south. It is also found that the overflow variations impact the strength of the LS convection, so that the deep-water formation regions are coupled through the dynamics of the deep boundary current. On the other hand, the variations in the LS water export into the North Atlantic influences the strength of the Subpolar Gyre (SPG), modulating the heat and salt transport towards the Nordic Seas.