



## **Non-linear response of the AMOC to buoyancy perturbations around Greenland**

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The Atlantic Meridional Overturning Circulation (AMOC) reacts sensible to density changes in regions of deep-water formation, e.g. the Labrador Sea. Therefore, the non-linear behavior of the AMOC and the water mass transformation in the Labrador due to strong freshwater perturbations (R0.5) around Greenland is investigated using the high-resolution Parallel Ocean Program (POP). In particular, the non-linear effects of a reversed freshwater inflow (R-0.5) and a stopped freshwater inflow (R0.0) on the AMOC are investigated.

Over 45 model years of the R0.5 simulation, the maximum AMOC at 35N decreases by about 50%. However, when reversing the freshwater inflow (R-0.5), the AMOC needs only about 10 years to fully recover. But when only stopping the freshwater inflow (R0.0) the AMOC remains at an off state. The mechanisms that cause these non-linear behaviors are presented.