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# Simulated interdecadal variability of the Atlantic THC in the GFDL CM2.1 climate model

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We present analyses of an internal mode of variability of the Atlantic thermohaline circulation in a 2000-year control integration of the GFDL CM2.1 coupled climate model, as well as its associated climatic impacts. This mode has a timescale of approximately 20 years, and involves fluctuations in the meridional transports of heat and salt. Associated with these fluctuations are variations in the atmospheric circulation in the tropical Atlantic, with a warm North Atlantic leading to a northward movement of the ITCZ and reduction of the vertical shear of the zonal wind. The ocean circulation changes are associated with fluctuations in ocean convective activity in the subpolar North Atlantic that appear to lead the ocean heat transport changes. Changes in the westerly winds, associated with the North Atlantic Oscillation, precede THC changes. We will also discuss the results of additional ensembles of experiments in which a perturbation forcing is applied to the subpolar gyre in the North Atlantic in order to systematically excite this mode of variability. These experiments allow a clearer characterization of the mode of variability, and shed light on its mechanism. We will also present analyses of an additional mode of simulated variability with a timescale of 200-300 years.