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Response of the (multi)decadal variability of the Atlantic meridional overturning circulation to suppressed variability in subpolar deep water formation (and overflows)

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We analyze a 1000 year long control experiment as well as a 1000 year long sensitivity experiment with suppressed variability of subpolar deep water formation, performed with a relatively coarse, but highly efficient, version of the Max-Planck-Institute Earth System Model. Our results suggest the largest influence of subpolar deep water formation variability onto the (multi)decadal variability of the Atlantic meridional overturning circulation (AMOC) between 40N and 50N. Based (so far only) on the control integration a similar conclusion can be drawn for the influence of the variability in the overflows from the Nordic Seas. It is interesting that the largest (multi)decadal variability of the AMOC in the control experiment (based on spectral power and standard deviation) is found at the same latitudes where we see the largest influence from subpolar deep water formation / overflow variability. To check the robustness of our results, long control integrations from four other coupled climate models as well as from a higher resolution version of the Max-Planck-Institute Earth System Model will be analyzed.