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Is the stability of the Atlantic MOC changed by global warming?

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We investigate the stability of the Atlantic meridional overturning circulation (AMOC) for the pre-industrial climate and a future climate with doubled and quadrupled CO2 concentrations, using data from the archive of coupled atmosphere-ocean model output of the Intergovernmental Panel on Climate Change. We determine the stability of the AMOC by examining the oceanic fresh water budget of the Atlantic basin. Earlier work has shown that the sign of the freshwater flux into the Atlantic basin that is carried by the AMOC determines whether it is in the monostable or bistable regime. We determine this fresh water flux in pre-industrial control runs and climate change runs from several coupled climate models. This enables us to study the change in stability of the AMOC due to increased greenhouse gas concentrations. This stability change may occur since the hydrological cycle, and hence the freshwater transport into the Atlantic Ocean, respond to global warming.