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Seasonal AMOC variability at 26,5°N in two coupled models and a forced ocean model : comparison to observations

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The Atlantic Meridional Overturning Circulation (AMOC) plays a key role in the meridional redistribution of heat by the ocean, with a notable influence on the mild climates in Europe. This study is motivated by the time series of AMOC available at 26,5°N with RAPID section since 2004. We assess the capacity of two coupled models (IPSL-CM5A and CNRM-CM5) and their common oceanic component (NEMO) in a forced configuration to capture the seasonal cycle of the AMOC. The approach considers the RAPID decomposition into three components of the AMOC, where the seasonal cycle of the western boundary currents (Florida and Antilles current), the Ekman transport and the interior geostrophic transport is here investigated succesively. The analysis shows a high sensitivity of the modelled AMOC to spatial resolution of boundary currents, although a significant inconsistency as compared to data can also be attributed to biased atmospheric forcing. Finally, the seasonal cycle of the heat transport is considered to quantify climate models' ocean heat transport in a climate change perspective.