Contribution ID: **211** Type: **not specified**

Ia: Atlantic Meridional Ocean Current (AMOC)

Wednesday 13 November 2024 15:30 (1h 30m)

The Atlantic Meridional Ocean Current (AMOC) transports vast amounts of warm water to the North Atlantic, where it cools, sinks, and changes direction, flowing through the mid-Atlantic and into the Southern Atlantic Ocean. This heat release prevents ice from forming in Northern Europe. However, global warming is decreasing the current's density and salinity, which in turn reduces its cooling, sinking, and southward flow. Paleo-evidence shows clear signs of AMOC weakening during past ice age terminations, indicated by changes in ocean hydrography and water mass tracers. Current assessments of AMOC stability are largely based on model results, indirect indicators like temperature patterns, and limited direct measurements. In this discussion, we aim to review the current state of knowledge, highlight the limitations of various methods, and synthesize data and models. One goal is to compile insights from AWI, drawing from diverse perspectives including empirical evidence, high- and low-resolution modeling, and conceptual frameworks.

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Session Classification: Breakout Sessions