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A multi-model analysis of the PMIP LGM AMOC

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Simulating and reproducing the past Atlantic meridional overturning circulation (AMOC) with comprehensive climate models are essential to test the ability of models to simulate different climates. At the Last Glacial Maximum (LGM), reconstructions show a shoaling of the AMOC compared to modern climate. However, almost all state-of-the-art climate models simulate a deeper LGM AMOC. Here, we conduct a multi-model analysis using outputs from all PMIP phases (PMIP2 to PMIP4) to consistently explore the causes of this paleodata-model mismatch. The analysis focuses on the role of sea-surface temperature biases in the piControl simulation as well as changes in ocean temperature, salinity and density in each oceanic basin. We further compare the deepwater formation regions in each model and explore potential implications on the interpretation of paleodata-model comparison.