

Simulating the Atlantic Meridional Overturning Circulation of the glacial period with comprehensive climate models

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The Atlantic Meridional Overturning Circulation (AMOC) plays a critical role on the climate system through its impact on heat transport and carbon cycle. There are abundant evidences from sediment cores showing a drastic reorganisation of the AMOC during the past glacial period. Especially at the Last Glacial Maximum (LGM), it has been shown that the AMOC has shoaled compared with that of the modern, and that the North Atlantic Deep Water was replaced by the southern sourced bottom water. Along with the proxy studies, many efforts have been made in the modelling community in simulating the AMOC at the LGM to understand the dynamics of the glacial AMOC. However, most comprehensive climate models simulated a deepening of the AMOC, which contradicts the proxy evidences. In this presentation, the author will review previous climate modelling studies of the LGM AMOC and their recent progresses. A particular focus will be paid upon the roles of glacial ice sheets and Southern Ocean on the AMOC, both of which are key components in understanding the glacial AMOC.

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