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The Barents-Kara Ice Sheet response to the CMIP6-PMIP4 simulations for the LGM climate

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Recent observations show an acceleration of the glacier outflow in the West Antarctic ice sheet (WAIS) since the mid-1990s and an increase in calving events. Compared to the 1979-1990 period, mass loss from WAIS has been increased by a factor six between 2009 and 2017. The reduced buttressing effect from ice-shelf breakup may favour the ice flow from outlet glaciers and in turn the sea-level rise with potential noticeable consequences on human societies. However, despite continuous model improvements, large uncertainties are still present on the representation future evolution of the WAIS. The large panel of different results in the projections of the future sea-level rise stands, in part, to our misunderstanding of the process responsible for the marine ice sheet evolution. A possible approach to better constrain these processes, is to investigate past marine ice sheets, such as the Barents-Kara ice sheet (BKIS) at the Last Glacial Maximum (LGM), which can be considered, to a certain extent, as an analogue of the WAIS. Our objective is to study the processes responsible for the collapse of the BKIS during the last deglaciation. To simulate the evolution of the BKIS, we use the GRISLI ice-sheet model (20 km x 20 km) forced by different CMIP5/PMIP3 and CMIP6/PMIP4 models. We will present the response of the ice sheet to different types of atmospheric and oceanic forcing at the LGM coming from the PMIP models. This study represents a first step before studying more in depth the respective role of each climatic field but also the role of sea level rise coming from other LGM ice sheets in triggering the retreat of the BKIS at the beginning of the last deglaciation and the impacts of the dynamical processes.