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# Comparison of data and model simulations over 4, 6, 8 and 10 ka snapshots at high-southern latitudes

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Paleotemperature reconstructions from Antarctic ice cores rely mainly on $\delta$D and $\delta$18O records, with the main key factors controlling their observed distribution in Antarctic surface snow being related to the condensation temperature of the precipitation and the origin of the moisture. Reconstructions of past sea-surface temperatures (SST) and sea ice cover (SIC) from marine cores at high southern latitudes mainly rely on diatom-based transfer functions and on the TEX86 proxy for temperature. However, quantitative records of SST and SIC are concentrated in the mid-latitudes of the Southern Ocean and only few records exist in the Antarctic coastal areas.
In the framework of the ESF PolarCLIMATE programme, the HOLOCLIP project aims to bring together the ice core, the marine core and the modelling scientific communities to understand the processes linking different components of the Antarctic climate system and linking climatic response to external forcing over the Holocene.
In this study, we analyse the comparison between the paleoclimate information derived from both Antarctic ice cores and southern high latitude marine cores, and model simulations performed with the LOVECLIM model using a data assimilation method over different snapshots: 4, 6, 8 and 10 ka BP. The snapshot simulations are in general agreement with the temperature reconstructions from the proxy records. Particularly, snapshot simulations capture the cooling from 10 to 8 ka observed in some ice core and marine records. This cooling is related to the coupled impact of high-latitude atmospheric circulation changes and enhanced freshwater melting from the WAIS.