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New perspectives on the inception after the Eemian from inverse ice-sheet modelling

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Over the past glacial cycles, sea-level records show strong variability going from one interglacial to the other. On this time scale, sea-level changes are dominated by changes of ice volume on land, predominantly by the waxing and waning of the large ice sheets on the Northern Hemisphere. The separate contributions of ice on both the Northern and Southern Hemisphere, however, are not precisely known, for which especially rapid changes in sea level, such as the strong drop during Marine Isotope Stage 4, are of great interest. To investigate these strong climate transitions, a fully coupled system of four 3-D ice-sheet models is used, simulating glaciations on Eurasia, North America, Greenland and Antarctica, explicitly calculating all ice volume contributions. The model is forced with deep-sea benthic δ^{18}O records, and uses an inverse forward modelling approach to reconstruct a self-consistent record of sea level, temperature and δ^{18}O. In this study, the aim is to make an assessment on the separate contributions of all four ice sheets during the last glacial period and comparing our findings with existing data of sea-level change.