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Simulating the Antarctic ice sheet in the late-Pliocene warm period: PLISMIP-ANT, an ice-sheet model intercomparison project

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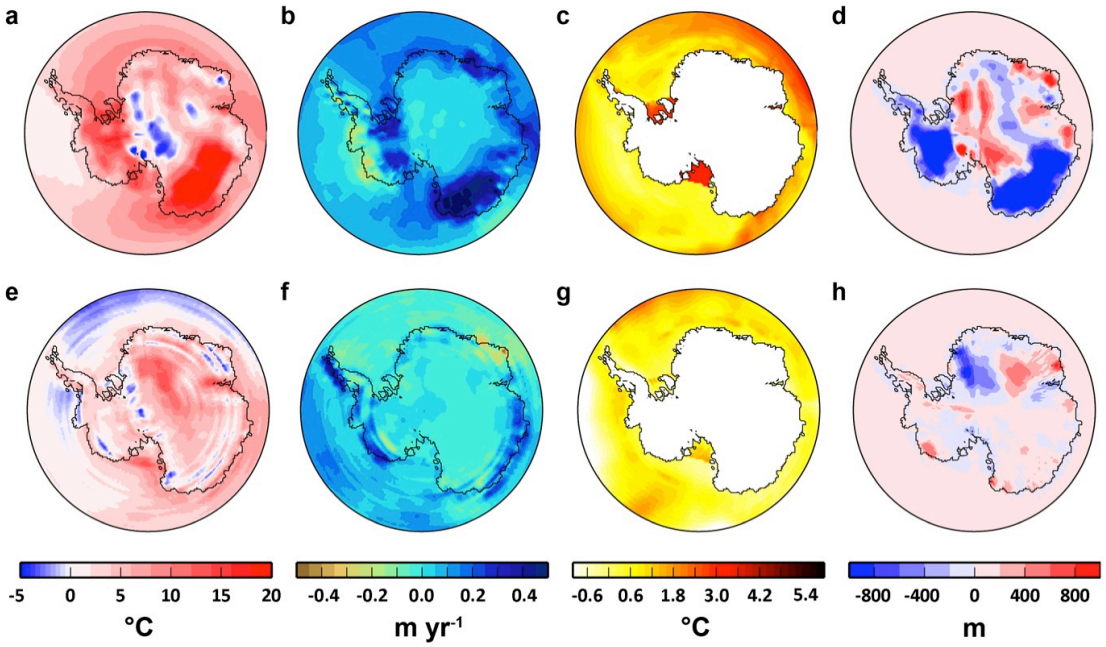

Fig. S1: Yearly mean difference in climatology relative to the HadCM3 pre-industrial climate. The top panels are for the HadCM3 Pliocene simulation (a-d), bottom panels for ERA-40 (e,f,h) and WOD-09 (g). From left to right, surface–air temperature in °C, Precipitation in m yr^{-1} water equivalent, sea surface temperatures and temperatures at the bottom of the PD ice shelves in °C and surface topography in the climate model in m. The black line in all panels represents the Bedmap1 outline of the grounding line.

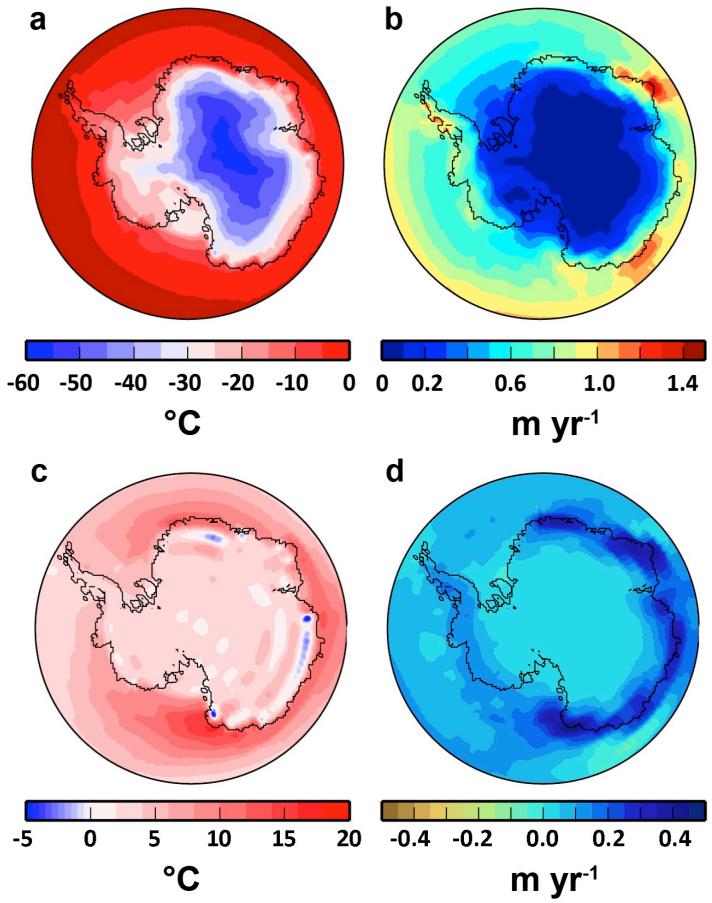

Fig. S2: Top panels show the yearly mean climatology of HadAM3 with Pliocene boundary conditions except a modern-day Antarctica. a) Surface-air temperature (°C), b) precipitation (meters per year). Bottom panels show the difference with the HadCM3 pre-industrial climatology. c) Temperature and d) precipitation. The black line in all panels represents the Bedmap1 outline of the grounding line.

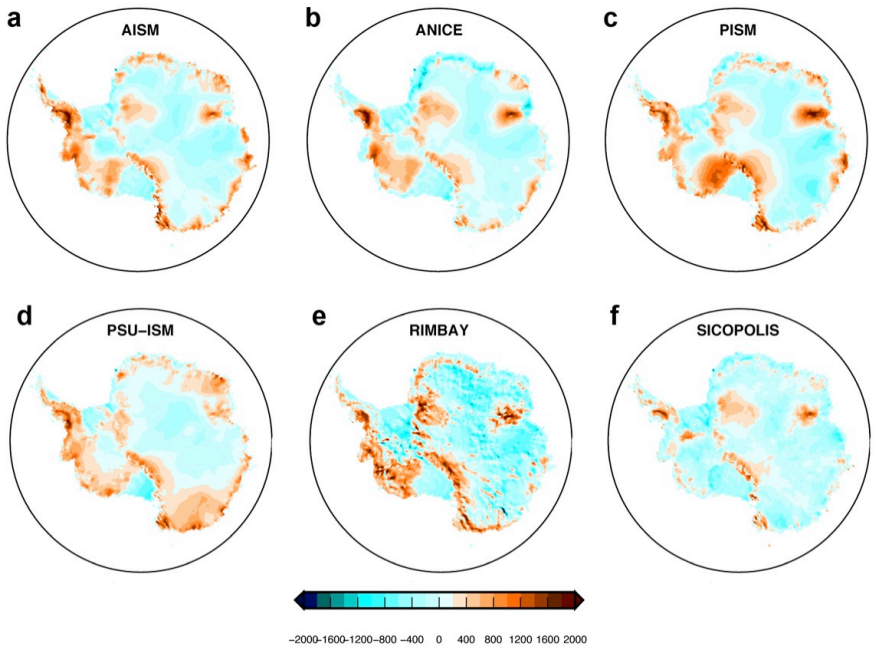

Fig. S3: Differences of ice thickness at the end of the simulation for the $Control_{HadCM3}$ experiment with the initial present day Bedmap1 ice thickness. a) AISM, b) ANICE, c) PISM. d) PSU-ISM, e) RIMBAY and f) SICOPOLIS.

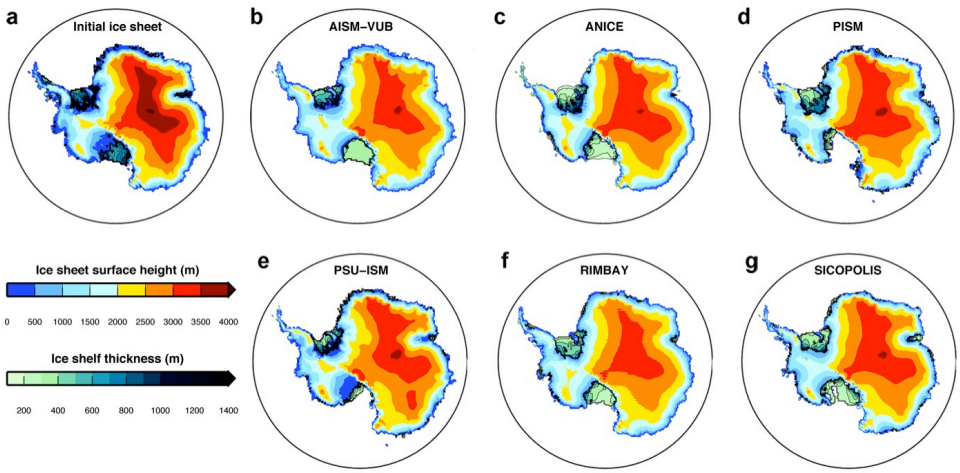

Fig. S4: Ice surface topography and ice thickness of the ice shelves for the $Control_{Obs}$ experiment with ERA-40/WOD-2009 climate forcing. a) Initial ice sheet from Bedmap1, b) AISM, c) ANICE, d) PISM, e) PSU-ISM, f) RIMBAY, g) SICOPOLIS.

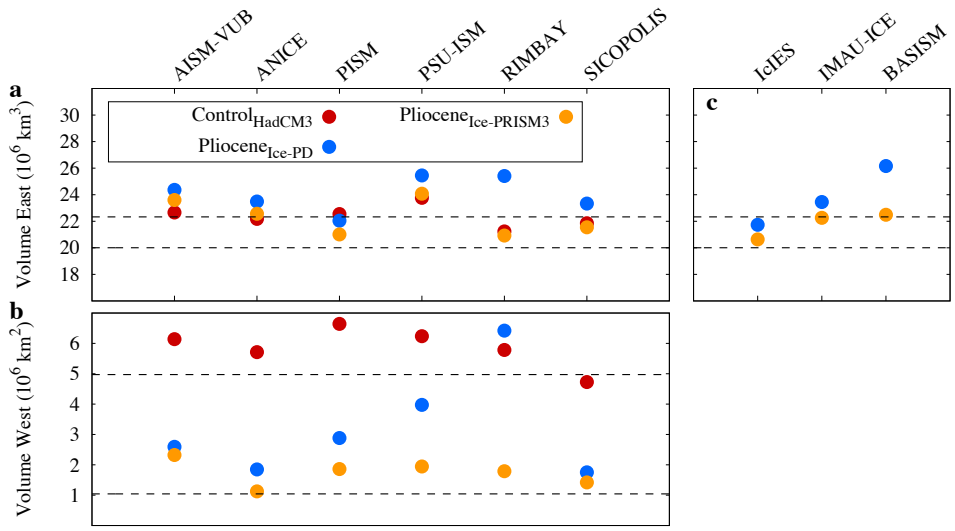

Fig. S5: Final grounded ice volume (10^6 km^3) for the Pliocene simulations with Bedmap1. Pliocene$_{Ice\text{-}PD}$ in blue, Pliocene$_{Ice\text{-}PRISM3}$ in orange and Control$_{HadCM3}$ in red. The horizontal dashed lines indicate the PD and Pliocene ice volume and area for the initial ice-sheet topographies. a) Grounded ice volume of East Antarctica for the SIA-SSA ISMs, b) grounded ice volume of West Antarctica for the SIA-SSA ISMs c) grounded ice volume of East Antarctica for the three SIA models. East and West Antarctica are divided by the meridians at 30 °W and 160 °E.

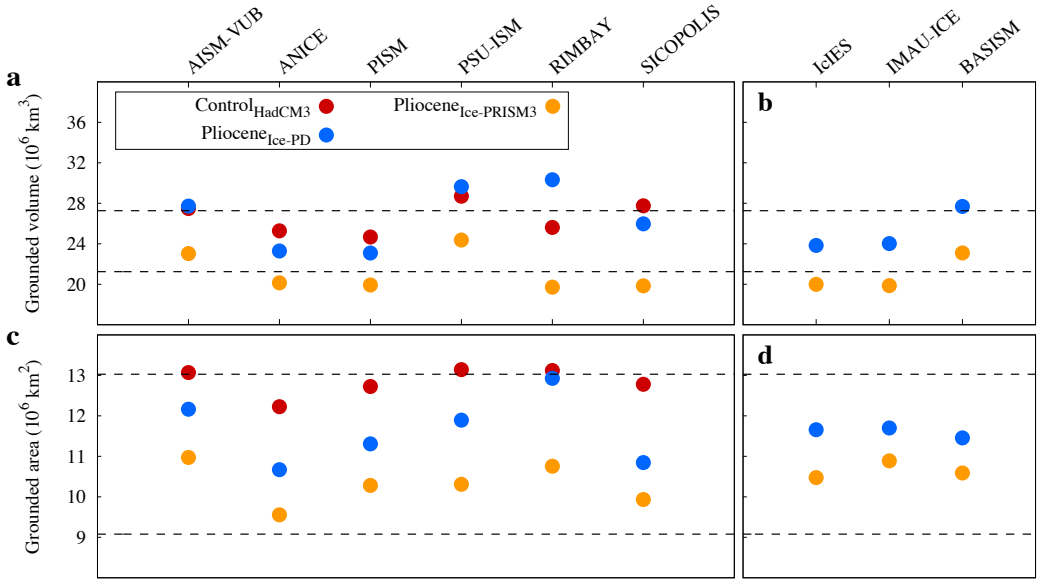

Fig. S6: Final grounded ice volume and area for the simulations with Bedmap2. Control$_{HadCM3}$ in red, Pliocene$_{Ice-PD}$ in blue, Pliocene$_{Ice-PRISM3}$ in orange. The horizontal dashed lines indicate the PD and Pliocene ice volume and area for the initial ice-sheet topographies. a) Grounded volume for the SIA-SSA ISMs (10^6 km^3), b) grounded volume for the 3 SIA ISMs, c) grounded ice area for the SIA-SSA ISMs (10^6 km^2) and d) for the SIA ISMs.

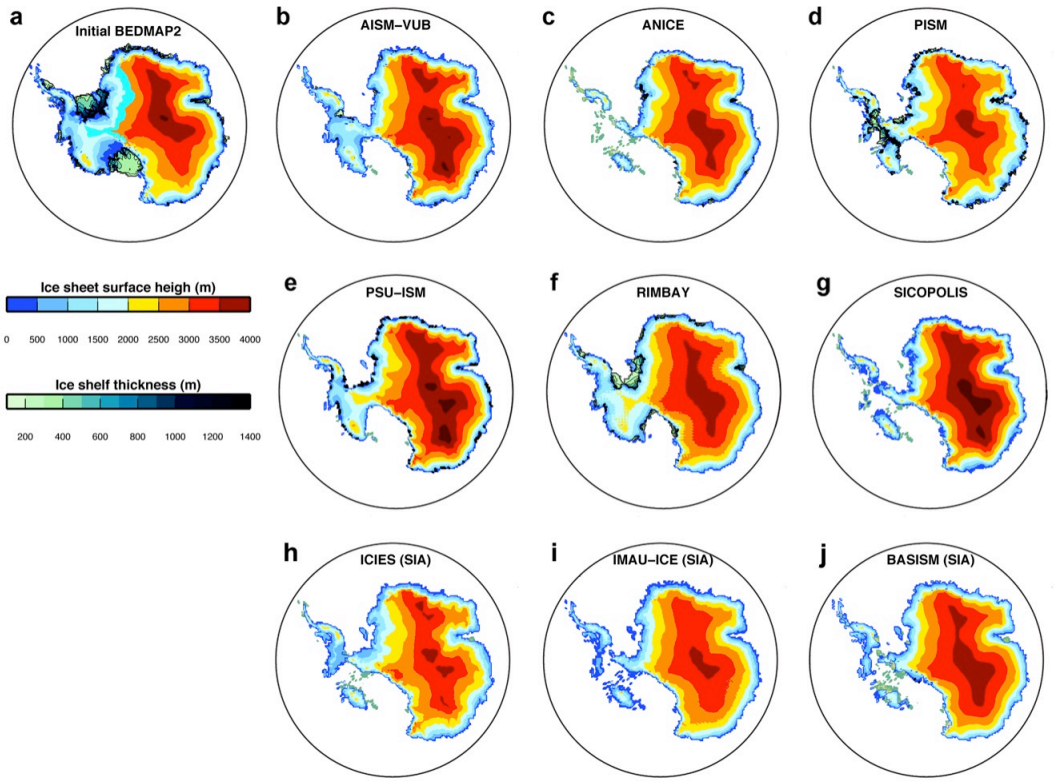

Fig. S7: Ice surface topography and ice thickness of the ice shelves for the Pliocene$_{\text{Ice-PD}}$ simulation with Bedmap2. a) The initial Bedmap2 ice-sheet topography. b) AISM, c) ANICE, d) PISM, e) PSU-ISM, f) RIMBAY, g) SICOPOLIS. SIA-only models; h) IcIES, i) IMAU-ICE, j) BASISM.