



## **Simulation of glacial Cycles with an Earth System Model of intermediate Complexity**

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We present simulations of the last four Quaternary glacial cycles with the fully interactive Earth system model of intermediate complexity CLIMBER-2. The model includes explicit treatment of atmosphere, ocean, biosphere and terrestrial ice sheets. Only the orbital forcing and the atmospheric CO<sub>2</sub> content are prescribed. The model successfully reproduces a number of features of glacial climate variability known from palaeoclimate data, such as the dominant 100 kyr cycle, Heinrich events and Dansgaard-Oeschger oscillations.

In particular, we inspected the role of CO<sub>2</sub> and terrigenous dust. We found that both of them are important factors (in addition to orbital forcing) to correctly capture the glacial to interglacial change in ice volume. Furthermore, a sensitivity analysis showed that, essentially, the change in ice volume is less susceptible to changes in parameters of the ice model than to changes in the mass balance parameterisation.