



Simulating an abrupt climate change during the Last Interglacial

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We use the recently released LOVECLIM1.3 model (www.climate.be/loveclim) to perform simulations of the climate of the Last Interglacial, between 130 and 115 kyr BP. Two options of the code are activated, i.e. an improved representation of tropical dynamics and a parameterisation of katabatic winds. Changes in atmospheric greenhouse gas concentrations and orbital parameters are used to drive the model in a transient simulation. The simulated global annual mean surface temperature peaks at around 128 kyr BP and then continuously decreases until a 'rapid event', which occurs at around 120.5 kyr BP. Then the model falls into another state characterised by a higher variability.

Here we discuss the causes and address the robustness of the rapid event. This event is associated with abrupt changes in surface temperature in the northern high latitudes, in particular in the Labrador and Barents Seas, in sea surface salinity in the Hudson Bay, Baffin Bay and Davis Strait, and in the pattern of convection in the Labrador Sea. Simulations with a reduced altitude of the Greenland ice sheet or using different parameter sets (adjustable parameters of the model) show similar features, with slightly different magnitudes.

LOVECLIM1.3 produces such a rapid event for all model configurations tested, which is in contrast to simulations of the Last Interglacial climate with other models. Moreover, climate reconstructions do not deliver a clear picture for such a rapid event.