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Modelling the climate change for the last 130,000years

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One of the challenges of earth system modeling is to explain the mechanism of ice age cycle by simulating it and to understand the uniqueness or necessity of the present state of climate, sea level and environment. Whether Milankovitch cycle or CO₂ is the driver and why the dominant periodicity of ice age cycle switched from 40 ka cycle to 100ka cycle have been remained unsolved. Here we simulate the glacial cycles and investigate the origin of saw-tooth shape 100ka cycle using a three dimensional ice sheet model with the input examined by GCM. Within the range of possibilities of the model, ice age cycles with a saw-tooth shape 100 ka cycle, the major NH ice sheets volume and the geographical distribution at the glacial maximum are successfully simulated. Additionally we show the GCM snap-shot simulations of the last glacial cycle in order to discuss the background environment change for human evolution.