

Numerical investigation of assessment for 1.5 Ma old ice core in the Dome Fuji region

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Drilling a deep ice core extending 1.5 million years (Ma) back in time is crucial to better understand the transition in the periodicity of the glacial cycles changed from 40 kilo year (ka) to the current 100 ka during the mid-Pleistocene transition (0.9–1.2 Ma). However, continuous ice core records more than 1 Ma have not been retrieved in the Antarctic ice sheet. Sufficient knowledge of the basal topography and thermal conditions beneath the ice sheet, and the three-dimensional ice flow regime from the bed to the surface are required to identify a suitable drilling site that may provide a continuous record of past mechanisms of climate change. A three-dimensional thermodynamic ice sheet model is a powerful tool to simulate internal and subglacial thermodynamical conditions of the ice sheet. In this study, we simulate the ice flow regime, subglacial thermal conditions and internal isochrones in the Dome Fuji region as well as along the JARE traverse route with the ice sheet model SICOPOLIS with high spatial resolution (8 km) to progress the identification of a suitable drilling site at the region.

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