



Glaciological characteristics in the Dome Fuji region and new assessment for 1.5 Ma old ice

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The retrieval of a continuous Antarctic ice-core record dating back 1.5 Ma is a key objective in palaeo-climatology in order to understand why the frequency of ice ages changed from 40 ka to 100 ka approximately 1 Ma ago. Here, we investigate the probability that the Dome Fuji region in East Antarctica contains ice more than 1.5 Ma old. We use a new radar dataset acquired in the Antarctic seasons 2014/15 and 2016/17 to improve the ice thickness map. Compared to previous maps of the region, the new dataset shows a more complex landscape with networks of valleys and mountain plateaus. We use the new dataset as input in a thermokinematic model that incorporates uncertainties in geothermal heat flux values in order to improve the predictions of potential ice-core sites. Our results indicate several areas of interest, especially the region immediately south of Dome Fuji station appears to be a good candidate site. An initial assessment of basal conditions revealed the existence of several wet-based areas and further radar data analysis shows overall high continuity of layer stratigraphy in the region. Thus, if a new drill operation were to take place in this area, extending the age-depth information from the Dome Fuji ice core to a new ice-core drill site is a viable option.