## An ice-flow modeling study for evaluation of sites for an oldest ice core around Dome Fuji, Antarctica

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The recovery of a new Antarctic ice core to cover one-million years before present will advance our understandings of the Quaternary climate. Previous ice flow modeling studies indicates that such old ice may exist in inland areas of the Antarctic continent, where the ice is thick enough, accumulation rate is low, basal temperature is well below the pressure melting point, and horizontal ice flow is slow. The 59th Japanese Antarctic Research Expedition (JARE59, 2017-2018 Antarctic summer) conducted glaciological field surveys for the selection of next deep drilling around Dome Fuji. In particular, a set of ground radar surveys were conducted around Dome Fuji for improved mapping of the bedrock topography as well as internal layers of the ice sheet.

In the present study, we use an one-dimensional ice flow model to investigate the influence of uncertain parameters, such as ice thickness, accumulation rate, geothermal heat flux, and thinning rate on the age estimation of ice especially in the lowest few hundred meters. The calculated age and temperature profiles are compared with previous depth-age models and borehole temperature at Dome Fuji for assessing the model performance for our purposes. The one-dimensional model is then applied to the vicinity of Dome Fuji along the transect of JARE 59 surveys, and simulated age profiles are compared with dated internal layers from the observation. We discuss the evaluation of potential site and the influences of uncertain parameters on the age of the deep ice core.