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Age-depth distribution in the larger Dome Fuji area from combination of radar internal layer stratigraphy and inverse modelling

Content

As part of the Beyond EPICA - Oldest Ice reconnaissance (OIR) the region around Dome Fuji was surveyed with a total of 19000 km of radar lines in the 2016/17 Antarctic summer. Internal stratigraphy in this region has now been mapped and major isochronous radar horizons connected to the Dome Fuji and EDML ice cores to obtain age estimates of the horizons. Based on the mapped age-depth distribution a one-dimensional inverse model has been applied to extend the age estimates to deeper regions of the ice sheet where no direct or continuous link of internal stratigraphy to the ice cores is possible. The large-scale distribution of the survey with low data coverage on the local scale and the rough basal topography, characterised by a mountainous region, together with a higher uncertainty in regional geothermal heat fluxes make age estimates more uncertain than in other areas of the Antarctic ice sheet. Moreover, it seems that transitions in the flow regimes from dome or divide flow to flank flow in the survey area challenge the applicability of a one-dimensional model.

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