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## High-resolution subglacial topography around Dome Fuji, Antarctica, based on ground-based radar surveys conducted over 30 years

### Content

The retrieval of continuous ice core records of more than 1 Myr is an important challenge in palaeo-climatology. For identifying suitable sites for drilling such ice, the knowledge of the subglacial topography and englacial layering is crucial. For this purpose, extensive ground-based ice radar surveys have been conducted around Dome Fuji in the East Antarctic plateau during the 2017–2018, 2018–2019 and 2021–2022 austral summers by the Japanese Antarctic Research Expedition on the basis of ground-based radar surveys over the previous ~30 years. High-gain Yagi antennae were used to improve the antenna beam directivity and thus attain a significant decrease in features of unfocussed along-track diffraction hyperbolae in the echoes from mountainous ice-bedrock interfaces. We combined the new ice thickness data with the previous ground-based data since the 1980s to generate an accurate high-spatial-resolution (up to 0.25 km between survey lines) ice thickness map. The new map reveals a complex landscape composed of networks of subglacial valleys and highlands. In addition, our map is compared with a few bedrock topography maps compiled by earlier independent efforts based on airborne radar data to examine the difference in features between the datasets. We also examined geographical and glaciological parameters such as bed roughness, bed slope, driving stress and hydraulic head based on the new ice thickness and bed elevation data. These new products and those analyses provide substantial constraints for identifying possible locations for new drilling.

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