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# Bed diagnosis in the Dome Fuji region, East Antarctica, using airborne radar data and englacial attenuation estimates

Kenichi Matsuoka (1), Brice van Liefferinge (1), Tobias Binder (2), Olaf Eisen (2), Veit Helm (2), Nanna Karlsson (2,3), Frank Pattyn (4), and Daniel Steinhage (2)

(1) Norwegian Polar Institute, Tromsø, Norway (matsuoka@npolar.no), (2) Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, Germany, (3) Geological Survey of Denmark and Greenland, Copenhargen, Denmark, (4) Universite libre de Bruxelles, Brussels, Belgium

Radar reflectivity of the ice-sheet bed has been used as a diagnostic measure of the basal conditions. Such bed diagnosis could lead to constrain magnitude and spatial pattern of geothermal flux which remains poorly known under the Antarctic Ice Sheet. Radar reflectivity can be estimated from the radar-observed bed returned power by extracting englacial attenuation. Attenuation exponentially depends on ice temperature, and can vary larger than the difference in the bed reflectivity for thawed and dry beds. In the 2016-17 austral summer, Alfred Wegener Institute carried out 150-MHz airborne radar survey for ∼19,000 line kilometers in a 400-km by 400-km area including Dome Fuji, East Antarctica, where the Oldest Ice is predicted to present. Bed topography, roughness, and subglacial hydraulic potential were analyzed and subglacial lakes were preliminary mapped. We extend that study by rigorous analysis of bed returned power. We hypothesize that model-predicted thawed area is consistent with high bed reflectivity area derived from the radar data, when englacial attenuation/temperature is derived for the correct geothermal flux. We carried out attenuation and radar reflectivity estimates for a range of geothermal flux and mapped spatial variations in the attenuation and bed reflectivity.