



Polarimetric radar sounding at Dome F deep ice coring site in Antarctica

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Determination of the crystal-orientation fabric, hereafter COF, can be used to reveal the deformational history of ice and to predict deformation and flow of the ice in the future. Due to the known effects of birefringence and scattering of radio waves, radar-echo sounding can be used to determine the COF over large volumes of ice. In this study, a recently developed VHF polarimetric radar was tested at an inland site in East Antarctica, at Dome Fuji, located near a dome summit. Radar data at Dome Fuji have exhibited typical birefringence features. By comparing the radar analyses with data from deep ice cores, we verified that the dielectric anisotropy of single ice crystals and COF of the ice sheet is explained quantitatively by radio wave propagation. The results suggest that radar methods can determine principal axes and strength of birefringence near dome summits or ridges. In the presentation, I focus on two topics, one propagation of VHF radio waves at the coring site where we have rich information on ice conditions, and performance of the new VHF polarimetric radio-echo sounder.