



Revealing irregular ice stratigraphy in the Recovery Region from englacial radar reflectors

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The Recovery Region, consisting of Recovery, Bailey and Slessor Glaciers, discharges 5 % of the total fresh water outflow of Antarctica into the Filchner Ice Shelf. The ice shelf is subject to extensive sub-shelf melting under ongoing climate change. Our recent analysis of airborne radar data shows both topographic and hydrologic controls on fast ice flow in this region. Our bed topography data suggests that changes in ice flow direction might have occurred here in the past. We detected a connection of Slessor and Recovery Glaciers through a narrow gate and the potential of change in ice flow direction between Slessor and Bailey Glaciers. A previous study already concluded on past fast ice flow from Slessor catchment to Recovery Glacier by identifying disturbed englacial reflectors. However, disturbed englacial reflectors can also be an indication of complex 3D interactions with the bed topography, englacial anisotropy, or local to regional-scale variability in stress regimes. To investigate ice flow in the Recovery Region in more detail we analyze the englacial reflectors, where and in which depth englacial reflectors in the region are continuous or disturbed. Therefore, we automatically determine the depth to which continuous englacial reflectors are observable. We analyze this lower limit and its spatial distribution in connection with ice thickness and basal roughness to diagnose the causes of the observed irregular ice stratigraphy.