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Stagnant ice and age modelling in the Dome C region, Antarctica

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Supplementary material

1D numerical model details

We use a modified version of the 1D numerical model in Lilien et al. (2021). We integrate over $\frac{1}{\tau}$ (Eq. 3) with linear interpolation between vertical nodes. The thinning function is fairly linear near the surface and changes more quickly with depth towards the bedrock, therefore we use a quadratic vertical grid. This means that the nodes are spaced further apart near the surface and are closer together near the bedrock. We use an average step size $d\zeta = 0.001$ and a ratio of 0.1 meaning that the distance between the first node at the surface and the second below is $1.9d\zeta$. The distance between the penultimate node and the bedrock node is $0.1d\zeta$.

MYIC age-depth profile

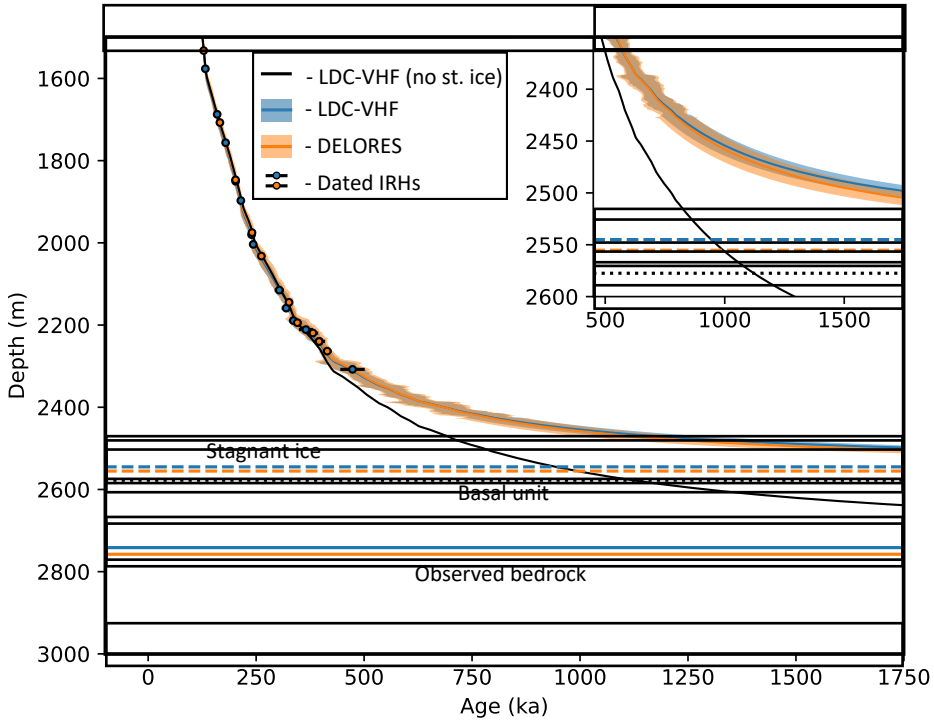

Figure S1. Modelled age depth profile at the BELDC drill site along with age uncertainty. Results for the DELORES dataset are in orange, results for the LDC-VHF dataset are in blue with the shaded areas showing 1σ uncertainty. Black circles are the IRH ages with their age uncertainties shown as horizontal bars (Tables II and III respectively). The thick continuous lines show the radar observed bedrock depths H_{obs} (colours indicating the dataset origin), the dashed lines provide the top of the modelled stagnant ice layer H_m and the dotted black line shows the top of the basal unit identified in the LDC-VHF radar survey. The inset shows the deepest modelled section in more detail. The black line shows the modelled age-depth profile predicted by the model with no stagnant ice layer.