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## The problem of signal loss for the upcoming Beyond EPICA Little Dome C (BELDC) ice core.

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The recently commenced drilling operation at the Beyond EPICA Little Dome C (BELDC) site will attempt to recover an ice core that reaches back to 1.5 Ma, a time during which the enigmatic Mid-Pleistocene Transition (MPT) took place. While the ice flow and heat flux regime at the drilling site will largely determine the age, as well as the nominal temporal resolution of the deeper parts of the BELDC core, molecular diffusion in solid ice will play a significant role in the effective temporal resolution of the  $\delta^{18}\text{O}$  signal. Here we look into the expected diffusion characteristics of the BELDC ice core by firstly addressing a previously reported problem, that of the  $\delta^{18}\text{O}$  signal loss in the deeper parts of the Dome-C ice core, particularly over Marine Isotope Stage 19 (MIS-19). By using isotope diffusion modelling in combination with high resolution  $\delta^{18}\text{O}$  data, we show the importance of the ice flow thinning function for the estimation of the diffusion length. We also comment on the large uncertainty imposed by the poor knowledge of the diffusivity coefficient. Based on recently published results on the dating of the BELDC site we provide a first order estimate of the effective resolution of the  $\delta^{18}\text{O}$  signal over the MPT transition.