



Abstract ID : 47

Age-depth model using radar measurements at Little Dome C

Content

Over the past 5 years, 3 sets of radar measurements were taken (UT, BAS, AWI/CPH/UA) around the 2 areas of interest for the European Beyond EPICA - Oldest Ice project, which aims to retrieve a 1.5 Ma old ice core - Patch A and Patch B of Little Dome C (BELDC). With the preparations of the BELDC drill site completed this season, we now use a combination of radar observations and numerical models to understand the age-depth distribution and dynamic properties of the ice in the area surrounding the drill site.

Several internal horizons have been traced and dated by linking them to the 800 ka old European Dome C ice core. We combine a 1D numerical model which uses inverse methods, constrained by the traced radar horizons and the AICC2012 EDC core accumulation profile.

Modelled results include the age of ice and thickness of a layer of stagnant ice along the radar lines for each of the 3 radar datasets. At BELDC, the average modelled age 60m above the stagnant was around 1.5 million years. We compare the thickness of modelled stagnant ice with that of the basal layer observed in the most recent measurements, and propose that they are the same.

These modelled results are directly relevant for the Beyond EPICA project and for the Australian team planning to drill at Patch A in the Million Year Old Ice project. With radar measurements from other areas in Antarctica the model could be applied to other planned drill projects such as those of Japan, China and the US. Currently, our 1D model is stable around ice sheet domes. We plan to develop a 2.5D model which takes into account ice flow, so could model regions of Antarctica with more varied topography.

Primary author: CHUNG, Ailsa (CNRS-IGE)

Co-authors: Dr PARRENIN, Frédéric (CNRS-IGE); Dr STEINHAGE, Daniel (AWI); Mr LENIUS, Sven (AWI); Dr MULVANEX, Robert (BAS); Dr CAVITTE, Marie (UT); Prof. EISEN, Olaf (AWI); Dr LILLIEN, David (CPH); Prof. DAHL-JENSEN, Dorthe (CPH); Dr TAYLOR, Drew (UA); Dr GOGINENI, Prasad (UA); Prof. MILLER, Heinrich (AWI)

Presenter: CHUNG, Ailsa (CNRS-IGE)

Track Classification: The Oldest Ice challenge, and the preservation of climatic signals in the deepest ice