

THE BELDC DEEP DRILLING OPERATION TO BEDROCK

Tuesday 16 September 2025 11:45 (20 minutes)

The European Project for Ice Coring in Antarctica (EPICA) Beyond EPICA –Oldest Ice aims at retrieving a continuous ice core record of climate feedback and forcing spanning about 1.5 Ma back in time. In that period the cyclicity of glacial/interglacial changes in continental ice sheet volume and temperature changed from 40 ka to the well-known 100 ka cycles encountered over the last 800 ka. After determining a suitable drill site Little Dome C (LDC), 35 km southwest of Concordia station, during an extensive pre-site survey, we penetrated to 2800 m depth during the third deep drilling season 2024/25, roughly spanning at least 1.2 Ma and a basal unit below 2584 m.

Here, we will focus on the implementation of the drilling operation: starting from an overview of the timeline of the project, the layout of the camp, upgrades to the drill system that enabled to drill 4.5 m long cores in a stable production mode, and ultimately drill in three seasons from the bottom of the pilot hole at 131.65 m below the surface to the bed at 2800 m depth. We will report on the drilling and core processing activities, that comprised Dielectric Profiling (DEP) and Laser Ringdown Spectrometry for water stable isotope determination already in the field, and provided a match of the record to existing ice core records like EPICA Dome C and marine records to estimate the climatic periods we recovered in the core.

References

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