

## Little Dome C

Beyond EPICA Oldest Ice Drilling Site (75.29917 °S, 122.44516 °E)

### Situation Report #23, 9<sup>th</sup> December 2025

#### Personnel @LDC:

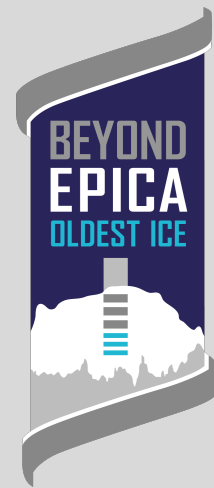
Carlo Barbante (UNIVE, CNR-ISP, PI in the field), Gianluca Bianchi Fasani (ENEA, Camp Leader), Katrin Ederer (AWI), Matthias Hüther (AWI, Chief Driller), Marion Lahuec (IPEV), Gunther Lawer (AWI), Johannes Lemburg (AWI), Barbara Seth (UNIBE), Philippe Possenti (CNRS), Chiara Venier (CNR-ISP), Sergio Zannini (ENEA), Mohammad Vafadarmianvelayat (AWI)

#### Personnel @DC:

NN

Weather at LDC: sunny and cold

Meteo at DC 09 pm: T = -30.7 °C, Wind speed = 2.0 kt, Windchill T = -35°C, Humidity = 71 %



Good morning from Little Dome C! While the Antarctic cold continues to keep us sharp, the mood in the drilling shelter is decidedly warm. We are now fully immersed in the intricate setup phase for the project's crucial second stage, and today brought some noticeably positive developments that give us great confidence for the days ahead.

As we measured much lower cutting forces as expected and, additionally, unwanted rotation during the broaching process, which we did not quite understand, we tested the broaching tool on the surface.

Therefore, we used two pieces of wood with the same distance as the hole diameter to check the motion of the broach and we observed the broaching knife cutting perfectly into the wood. As we wanted to increase the cutting forces to potentially limit the rotation during broaching, we increased the cutting depth from 3 to 5 mm. Unfortunately, this did not increase the cutting forces significantly.

After more downhole testing we decided to yoyo to an acceptable position and broached for 25 m (2352 m to 2327 m depth). We observed a rotation of approximately 110°. Therefore, we plan to start the reaming at 2338 m, where the groove is perpendicular to the inclination, down to the bottom (2352 m), where the groove is at the up-side of the hole.

After retrieving the broaching tool we assembled the reaming tool onto a 2.5-m-core barrel to start the reaming in the next morning.

As promised, we're taking a momentary break from deep ice to talk about a piece of technology just as essential to our daily survival as the coring system itself: the **Incinolet**. The Incinolet is a clever piece of technology that completely bypasses the need for water and conventional plumbing. Think of it as a specialized, self-contained oven designed for human waste.

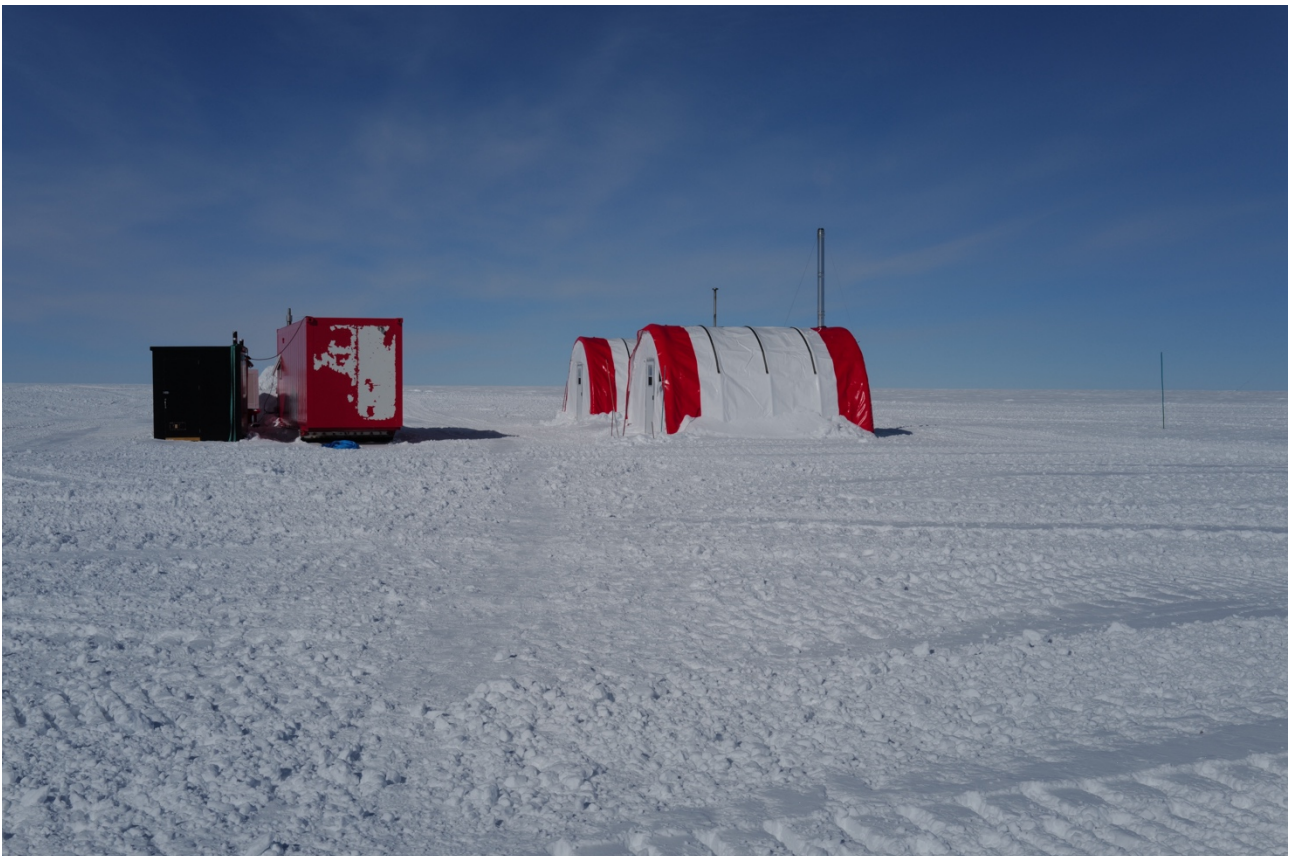
The entire process begins with the user placing a special, cone-shaped paper liner into the toilet bowl. This liner is crucial because it acts as a catcher for the waste, preventing it from touching the stainless steel surface and keeping the unit clean. Once the toilet has been used, the user activates a pedal, which opens a door at the base of the bowl, allowing the paper liner and its contents—both solids and liquids 😊—to drop directly into the incineration chamber below.



The user then presses the "Start" button, which initiates the powerful electrical cycle. A high-wattage electric heating element is activated, rapidly raising the temperature inside the chamber. Simultaneously, a strong blower motor starts running. The initial heat causes all the liquid waste to evaporate quickly. After the liquid is gone, the intense, furnace-like heat (often reaching well over 700 °C) completely incinerates the remaining solid waste and the paper liner. The entire mass is reduced to a tiny amount of sterile, clean ash, ... hopefully. This ash accumulates in an easily removable **ashpan** at the bottom of the unit.

To manage odors, the Incinolet uses a sophisticated system. The blower continuously pulls air from the room, through the chamber, and then forces the hot exhaust gases through a **catalyst bed**. This catalyst acts like a catalytic converter in a car, burning off any odor-causing gases before they are vented safely to the outside through an exhaust pipe. This process ensures the room remains odorless during and after the cycle.

The full incineration process, which includes the heating and a subsequent cool-down phase (where the fan continues to run to drop the internal temperature), typically takes over an hour. Of. Course you do not have to assist the whole process.



The black cube on the left is the famous "Incinolet" an essential component of the Little Dome C Camp. In the center the "Modulo Bagno" (described yesterday) and the two sleeping tents. Photo by C. Barbante.





We tested the deviation tool using two pieces of wood with the same distance as the hole diameter to check the motion of the broach and we observed the broaching knife cutting perfectly into the wood. Photo by G. Lawer.

CB, GBF, BS & MH; LDC, 09.12.2025

