

Little Dome C

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

Situation Report #25; Tuesday 27 December 2022

Personnel @LDC:

Saverio Panichi (ENEA, Camp Leader), Frank Wilhelms (AWI, Chief Driller), Robert Mulvaney (BAS, Chief Scientist), Giuditta Celli (ENEA), Romily Harris Stuart (LSCE), Matthias Hüther (AWI), Gunther Lawer (AWI), Johannes Lemburg (AWI), Martin Leonhardt (AWI), Michele Scalet (ENEA), Julian Westhoff (NBI), Andrea de Vito (ENEA)

Personnel @DC: Markus Grimmer (UNIBE), Florian Krauss (UNIBE)

Weather at LDC 5 pm: cloudy, slight snowfall, 5 knots, 644 hPa

Meteo at DC 5 pm: T = -28°C, Wind = NW, 5 knots, Wind Chill T = -38°C



One small screw – lost and found



Photo held over from previous day.... The 4-meter system outer barrel, which is 10 m long, is brought into the drill tent by (left to right) Matthias, Lemmi, Frank and Gunther to mount onto the drill tower, and connect to the anti-torque and motor sections. (Photo: Mulvaney, Leica SL2, 35mm, 1/160, f10, ISO400)

After the change to the 4-meter core barrel drill yesterday evening, and with three good runs, we continued with the longer core system this morning. After two runs of over three meters, we had some bad luck: one of the three spring-loaded pins that lock the hollow shaft onto the drive shaft of the motor popped out when re-mounting the hollow shaft. Further inspection revealed that the screw that held the locking pin in the mount had been lost. The suspicion was that the screw had been lost during the previous run, and fallen into



the borehole, or with some luck had managed to be caught in the chip chamber. We spent a messy thirty minutes trawling through the chippings/fluid slurry from the last run (which comes out of the drill at a temperature of about -50°C) trying to locate the pin, but couldn't find it.

Hoping that we had simply missed the screw somewhere, we continued to drill, but the next few runs ended short, and with a high current, suggesting that the lost screw was down the hole, and interfering with the cutting of ice by the drill head. Surprisingly, we saw no damage to the cutters which is normal in this situation, and meant that we were not really certain that the screw was the cause of the short runs and high closing current.

However, during the last shift of the day, the run ended after only 14 cm of penetration with a sudden surge to a high current, and the drill motor stalling. Bringing the drill back to the surface revealed the lost screw jammed between the inner and outer barrel. No damage done, we will continue drilling.



Julien shows of the lost and finally recovered screw. (Photo: Mulvaney, Leica SL2, 20mm, 1/25, f11, ISO400)





Close-up of the lost screw from the locking pin, jammed between the inner and outer barrel. (Photo: Mulvaney, Leica SL2, 35mm, 1/25, f11, ISO400)

End of day statistics:

Individual runs of the drill were recorded as: 3.36, 3.27, 1.64, 2.24, 2.22 0.14, 2.17 m

Drillers' depth: 370.03 m; daily total 16.05 m

Loggers' depth: 374.91 m; daily total 16.09 m

Processors' depth: not known today

RM and FW, 29.12.2022

