

INTERNATIONAL YOUNG NATURALISTS TOURNAMENT

PROBLEM 10: ICE HOLE

Croatian team

FORMULATION OF THE PROBLEM

You have drilled two ice holes in a frozen lake on a frosty winter day. One ice hole is close to the shore, while the other ice hole is far from the shore. Surprisingly, the height difference between the ice surface and the liquid water is different for each hole. How can you explain this? How can you use this height difference to determine the local ice thickness?

ICE

- Creates because of air temperature
- Ice forms at 0 °C
- The water starts to cool from the surface – the surface water starts to sink – until all the water is cooled to 4 °C – surface water continuous to cool but it stays on the surface – the water starts to freeze



Exsperiment

- liquid nitrogen
 - 2 plates
 - Water
-
- we brought liquid nitrogen with a hose to the plate with water
 - Covered it with another plate
 - After 15 minutes we got a icy surface of the water



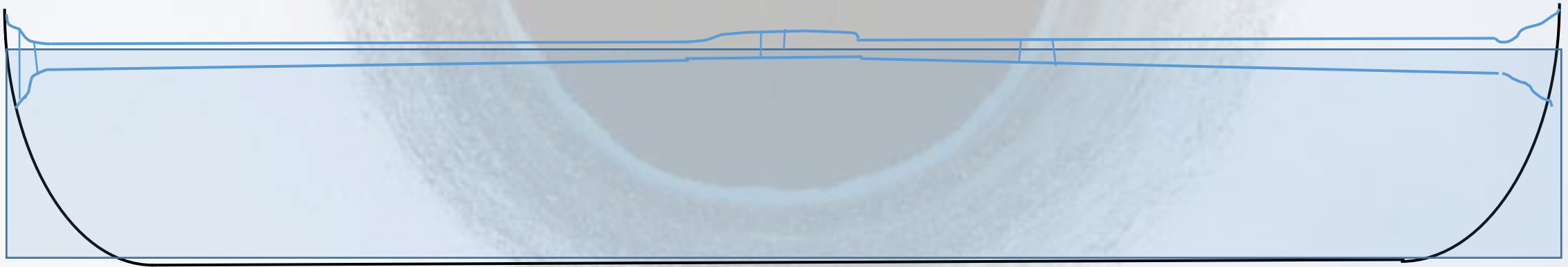
IS THE SURFACE OF THE ICE FLAT?

- forms at the edges – to the middle
- frozen crust is thicker at the edge



WATER LEVELS IN ICE HOLES

- Bulge in the middle → water is low in the hole
- Edges → water is high in the hole
- In between → water is in the middle of the hole



THANK YOU FOR YOUR ATENTION!



Presenter: Klara Stojčević

Position of nitrogen inlet

