Phase-sensitive radar as a tool for measuring

FIRN

compaction

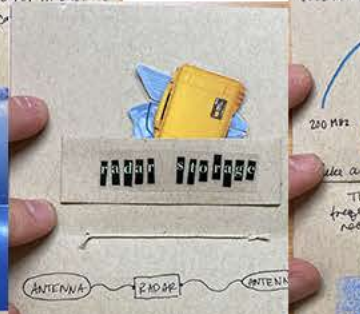
a zine by Elizabeth Case

When snow falls and survives for longer than a year, glaciologists call the old snow »FIRN«, derived from a German word meaning "of last year"

'glaciologist = glacier-ologist, a scientist who studies glaciers

...ger grain sizes, the denser it ...ghed down by subsequent snowfall ...rformed by grain-sca...

...s on glaciers, firn beco... ...s into glacial ice.



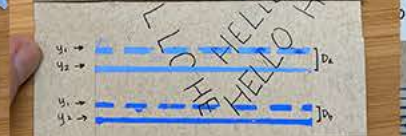
We can measure this process of densification - this evolution of snow into glacial ice - using a ground-based radar called an "Autonomous Phase-Sensitive Radio Echo Sounder," or ApRES[1] for short.

[1] NOT TO BE CONFUSED WITH APRES SKI, A BOOT-TIME POST-SKIING

The radar transmits a wave whose frequency changes over the course of a one-second measurement, called a chirp.[2]

...ke a tweet for radars

...year later... we return to the same locations to take another measurement



Comparing the first (y_1) and second (y_2) measurements, we can figure out how far the layers moved relative to each other. In this firn, we expect $D_a > D_b$. The greater the difference, the faster the firn is compacting.

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...ll firn compaction ...as the climate crisis ...? Tools like the ApRES ...o us figure that out.