

Local Scale Snow Density on an Antarctic Ice Rise.

One method to calculate ice sheet surface mass balance is to combine snow and firn density and compaction models with repeat laser altimetry. Despite this established method, snow density remains poorly understood, particularly in the upper meter. Before we improve our models, it is useful to understand snow density from observations. Thus, we will explore snow density variability in the upper meter by investigating approximately 700 density profiles collected with a Snow Micro Pen over an Antarctic ice rise in 2019.

I will determine if there is statistically significant snow density variability across a latitudinal transect. Is this variability larger than instrument uncertainty? I hypothesize there is significant differences in snow density, likely because of different drifting snow conditions.

Furthermore, I will examine snow density profiles collected within 20 m of each other and determine if sastrugi significantly impacts near surface snow density.

Data:

1. Snow Micro Pen density
2. Wind speeds from Jan 1 and 2 weather stations of RACMO2 5.5 km DML simulation.