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Glacier Analysis Using GPR Applied to Pine Glacier

Andrew Santos (Federal University of Pará (UFPA)), Jandyr Travassos (Universidade Federal do Rio de Janeiro), Ellen de Nazaré Souza Gomes (Federal University of Pará)

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Introduction

The use of Ground Penetrating Radar (GPR) in glaciers has proven to be a valuable tool for investigating internal structures, stratification, the presence of subglacial water and other geophysical characteristics. This data is essential for understanding glacier dynamics and their response to climate change. In this work, we are processing and analyzing GPR data collected from Pine Glacier in Antarctica, with the aim of identifying internal layers and heterogeneities that may indicate the presence of possible pockets of water or sediments and variations in ice density.

Method and/or Theory

The data was collected using a GPR with a frequency of 50 MHz. The processing software ReflexW was used for visualization and analysis and the data processing included: noise filtering, gain correction to compensate for signal attenuation at depth and Interpretation of reflectors.

Results and Conclusions

The processed data is expected to reveal the internal stratification of the glacier, indicating variations in snow and ice accumulation, flow structures, which may indicate glacial deformation, pockets of subglacial water or sediments, important for understanding glacier hydrology and dynamics and total ice thickness, useful for volume and mass estimates.

This study aims to contribute to the understanding of the glacier's internal structure, providing support for glacial dynamics models. In the future, integration with other geophysical techniques and climate data may enhance interpretation.