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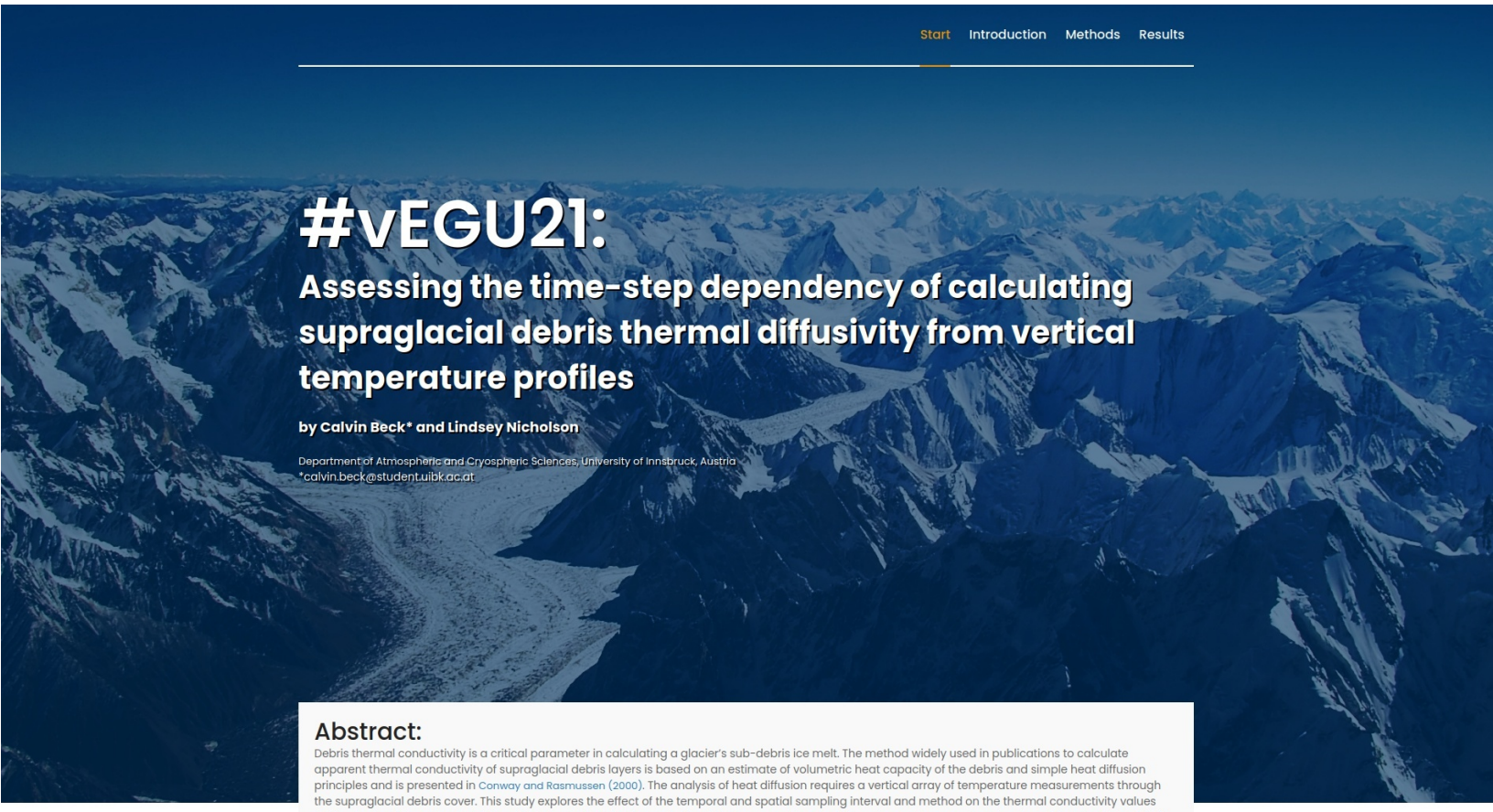

Abstract:

Debris thermal conductivity is a critical parameter in calculating a glacier's sub-debris ice melt. The method widely used in publications to calculate apparent thermal conductivity of supraglacial debris layers is based on an estimate of volumetric heat capacity of the debris and simple heat diffusion principles and is presented in Conway and Rasmussen (2000). The analysis of heat diffusion requires a vertical array of temperature measurements through the supraglacial debris cover. This study explores the effect of the temporal and spatial sampling interval and method on the thermal conductivity values derived using this method. Initial results indicate that the thermal diffusivity decreases linearly with an increasing sampling time from 30min to 6h by 0.2-0.4 mm^2/s for glaciers in high mountain Asia during the monsoon season. These results suggest that care must be taken in choosing the analysis time interval for computing debris thermal conductivity and for comparing values between datasets sampled at different intervals. Current research aims to further investigate the cause of the artifact and determine how this problem can be solved. An open-source web application is therefore developed to help other scientists investigate the effect of the sampling interval on their calculated sub-debris ice melt. This study falls under the remit of the IACS working group on debris-covered glaciers and is supported by data provided from within this group.

-> EGU presentation 27.04.2021

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1. Introduction: