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Turning upside down: Temperature inversions in Greenland

#Temperaturinversionen #Grönland #Langzeitveränderungen

The upper, warm, and sunny layers of air in the mountains and the cold cloudy layer of air in the valley, is a typical weather condition due to temperature inversions. These are the reversal of the otherwise typical temperature decrease with elevation within the atmospheric boundary layer. This phenomenon is particularly common in the Arctic, and different mechanisms steer its formation. Strong and thick surface-based temperature inversions are persistent in large parts of Greenland, because 80 % of it is covered by the Greenland Ice Sheet, and hence radiative cooling occurs over a large region. Recently, we analyzed the vertical temperature profiles from 1979 to 2017 over Greenland and found large differences and changes in the frequency, strength and seasonal distribution of inversions. Some insight about this work on spatiotemporal variations and trends of temperature inversion characteristics will be given, and mechanisms driving the changes in the temperature inversions in Greenland for the past four decades will be discussed. Furthermore, turning from the large scale to a complex valley topography, a closer look will be taken on the Zackenberg region (Northeast Greenland).

Sonika Shahi works as a University assistant and is enrolled in a PhD programme at the University of Graz. Her background is in glaciology and her current research focus is on analyzing the surface boundary layer of Greenland by using a combination of measured data and climate model output. More specifically, her research interests are the spatial and temporal variations of temperature inversions and their effects on the Greenland energy budget. Prior to this, she completed her MSc studies by a research degree in Glaciology at Kathmandu University (Nepal) with the focus on the energy balance modelling of a debris covered glacier in Nepal.

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