



Spatially heterogeneous firn on a remotely located mountain glacier in Central Asia

Marlene Kronenberg, Horst Machguth, and Martin Hoelzle

Department of Geosciences, University of Fribourg, Fribourg, Switzerland (marlene.kronenberg@unifr.ch)

Accumulation areas of remote mountain glaciers are difficult to investigate and therefore firn measurements from such glaciers are sparse. Furthermore, accumulation distribution on mountain glaciers is often highly variable at small spatial scales. This leads to spatially heterogeneous firn characteristics. The spatial extrapolation of firn measurements retrieved from shallow cores consequently implies large uncertainties. Spatial heterogeneity of the firn also challenges any attempt to quantify changes in firn characteristics over time, based on repeated firn core analysis.

Complementary measurements such as GPR data provide valuable information about the accumulation distribution. Here, we present measurements from the accumulation area of Abramov glacier, Pamir Alay, Kyrgyzstan: Several shallow cores and GPR measurements from 2018 provide information about the current firn state and about the accumulation distribution. Deep snow pits and cores from the 1970s as well as repeated accumulation measurements at a high spatial resolution provide unique information about past firn characteristics. We aim at spatially extrapolating recent firn measurements from shallow cores using GPR data to obtain distributed firn characteristics for Abramov glacier. These characteristics are then compared to legacy measurements with the goal to quantify, over nearly 5 decades, firn evolution on this remote mountain glacier.