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Re-establishment of long-term glacier monitoring in Kyrgyzstan and Uzbekistan, Central Asia

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Glacier mass balance is an important indicator of climate change. The internationally recommended multi-level strategy for monitoring mountain glaciers combines in-situ measurements (mass balance, front variations) with remote sensing (inventories) and numerical modelling. This helps to bridge the gap between detailed local process-oriented studies and global coverage. Several glaciers in Central Asia, i.e. Abramov and Golubina Glacier were some of the most important reference glaciers in the world-wide glacier monitoring program representing important mountain ranges, such as the Pamir-Alay and the Tien Shan mountains. For these glaciers long-term series of more than 20 years are available. After the break-down of the former Soviet Union, most of the measurements were abandoned. In a cooperative effort between the countries Kyrgyzstan, Uzbekistan, Germany and Switzerland, the measurement series are currently re-initiated and will be continued within the next years.
This study shows the measurement strategy and network, and discusses new installations, which have been set up at Abramov in summer 2011 and Golubina Glacier in summer 2010. The research strategy is composed of three main components. The first component is based on mass balance measurements using the glaciological method, the second relies on snow line observations with installed automatic cameras taking several pictures per day in order to document the snow line evolution on the glaciers during the summer months. The third is the application of a mass balance model driven by a nearby automatic weather station. The advantage of this strategy is that the three different components can be used to test them against each other, or to use them for calibration purposes.
A second objective of the re-established glacier monitoring programs is to reconstruct the mass balance for the time period, where no measurements are available. Continuous mass balance series for each glacier will be derived based on a well calibrated mass balance model.