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Surface energy balance of Keqicar Glacier, Tianshan Mountains, China, during ablation period

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The meteorological data of ablation season in 2005 were recorded by two automatic weather stations on Keqicar Glacier in southwestern Tianshan Mountains in China. One is operated on the glacier near the equilibrium line with the altitude of 4265 m (site A) and another is operated on the glacier ablation area with the altitude of 3700 m (site B). These data were used to analyze the meteorological conditions and the surface energy balance (SEB) of Keqicar Glacier. The net radiation was directly measured, and the turbulent fluxes were calculated using the bulk aerodynamic approach, including stability correction. The ablation value of 0.68 m w.e derived from four ablation stakes is in close correspondence to the modeled ablation value of 0.71 m w.e calculated from the surface energy balance. During the observation period, the net radiation accounts for 81.4% of the total energy with its value of 63.3 W m-2. The rest energy source is provided by the sensible turbulent heat flux with its value of 14.4 W m-2. Energy is consumed mainly by melting and the evaporation, accounting for 69.5% and 29.7% of the total energy with their values of 54.0 W m-2 and 23.0 W m-2 respectively. The radiative energy dominates energy exchanges at the glacier-atmosphere interface, governed by the variation in net shortwave radiation. Net short-wave radiation varies significantly due to the effects of cloudiness and the high albedo caused by fallen snow. Wind speed influences the turbulent fluxes distinctively and sensible and latent flux is much bigger on July with high wind speed