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Energy and Mass Balance of Kilimanjaro Glaciers: Complexity and spatial Variability in climatic Forcing

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In light of glacier retreat on Kilimanjaro, East Africa, three automatic weather stations (AWS) are currently collecting meteorological and glaciological data on the mountain. Their spatial distribution follows preliminary observations where it has been established that there are at least three different glacier regimes on the mountain, which differ with respect to energy and mass exchange at their glacier-atmosphere interface. For the first time in our project, data from all stations over the same time period are available. This paper presents results of the AWS data application to an energy balance model, the setup of which was moreover supported by a short-term eddy correlation experiment. Energy exchange characteristics of the different glacier regimes will be compared, along with associated mass loss processes. Particular importance will be attached to the ratio between sublimation and melt, as this may help to assess the role of glaciers in the regional water supply.