



Assessing potential reasons for different precipitation patterns on Mount Kenya and Kilimanjaro

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Mount Kilimanjaro and Mount Kenya in tropical East Africa are often considered as typically influenced by the same air mass. Yet, both precipitation patterns and glacier behavior differ considerably on these neighboring mountains. This indicates that either different air masses are at play or that precipitation processes are considerably different. The present study aims to investigate the most relevant driving mechanism of precipitation over the two neighboring mountains. First, ERA-Interim reanalysis data are used to characterize the atmospheric background conditions of days with precipitation simultaneously recorded on both Kersten Glacier (Kilimanjaro) and Lewis Glacier (Mt Kenya). From this analysis idealized vertical profiles are constructed and used as an atmospheric reference state for simulations with the Weather Research and Forecasting (WRF) model. The semi-realistic model topography is constructed from a high-resolution digital elevation dataset (SRTM). A series of sensitivity simulations is carried out with modified topography, vertical sounding and surface sensible heat flux to assess the dominant factors governing precipitation over the two mountains. With this, we aim to enhance the climate information from the differently behaving glaciers on the two East African mountains.