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Characteristics of summer energy balance on the west coast of the Antarctic Peninsula

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Abstract:

The characteristics of summer energy budgets in the ablation zones during the summer at the surface of two glaciers in the Antarctic Peninsula are investigated and compared to the findings of previous studies. The study areas are located on King George Island (62° S) and in Marguerite Bay (68° S). The summer energy balance was computed from automatic weather station data. The results reveal that turbulent heat fluxes dominate over radiation balance in Marguerite Bay, whereas on King George Island ablation is driven by net radiation. The summer energy balance on King George Island reflects the more maritime subpolar climate along the northwest tip of the peninsula in contrast to a more continentally toned polar climate in Marguerite Bay and areas further south. The terms of the energy balances are partitioned very differently, but advection from northerly directions causes the highest summer snowmelt rates at both study sites. It is concluded that sensitivity studies should consider not only the mean air-temperature increase, but also possible changes in other climate parameters.

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