

## Temperature lapse rates and surface energy balance at Storglaciären, northern Sweden

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**Abstract** A detailed meteorological experiment, including the operation of several automatic weather stations on and outside the glacier, was performed on Storglaciären, a valley glacier in Sweden, in summer 2003. On average, near surface air temperature lapse rates derived from several weather stations on the glacier were  $-6.0 \pm 3.5^\circ\text{C km}^{-1}$ , indicating strong temporal variability. We found no correlation with meteorological variables as a base for parameterization in melt modelling. Surface energy balance computations showed that, on average, net radiation is the largest contributor to melt energy, in agreement with previous studies. Latent heat fluxes were positive throughout the simulation period indicating condensation. It was not possible to constrain roughness lengths within several orders of magnitudes, since the differences in modelled melt for all cases were still within the range of uncertainty pertinent to the melt measurements during the 13-day period of coincident meteorological and melt measurements.

**Key words** ablation; automatic weather stations; glacier; modelling; surface energy balance; temperature lapse rate

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