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Laboratory experiments of heat and moisture fluxes through supraglacial debris

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Inspired by earlier work (Reznichenko et al., 2010), we have carried out experiments within a climate chamber to explore the best ways to measure the heat and moisture fluxes through supraglacial debris. Sample ice blocks were prepared with debris cover of varying lithology, grain size and thickness and were instrumented with a combination of Gemini TinyTag temperature/relative humidity sensors and Decagon soil moisture sensors in order to monitor the heat and moisture fluxes through the overlying debris material when the experiment is exposed to specified solar lamp radiation and laminar airflow within the temperature-controlled climate chamber.

Experimental results can be used to determine the optimal set up for numerical models of heat and moisture flux through supraglacial debris and also indicate the performance limitations of such sensors that can be expected in field installations.

Reznichenko, N., Davies, T., Shulmeister, J. and McSaveney, M. (2010) Effects of debris on ice-surface melting rates: an experimental study. Journal of Glaciology, Volume 56, Number 197, 384-394.