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On the energy budget of a low-Arctic snowpack

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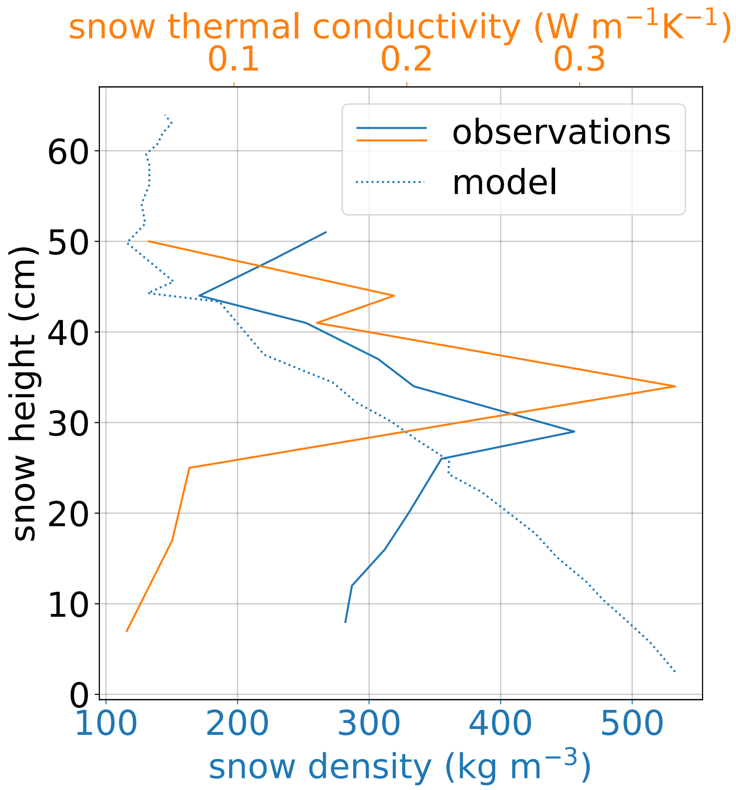
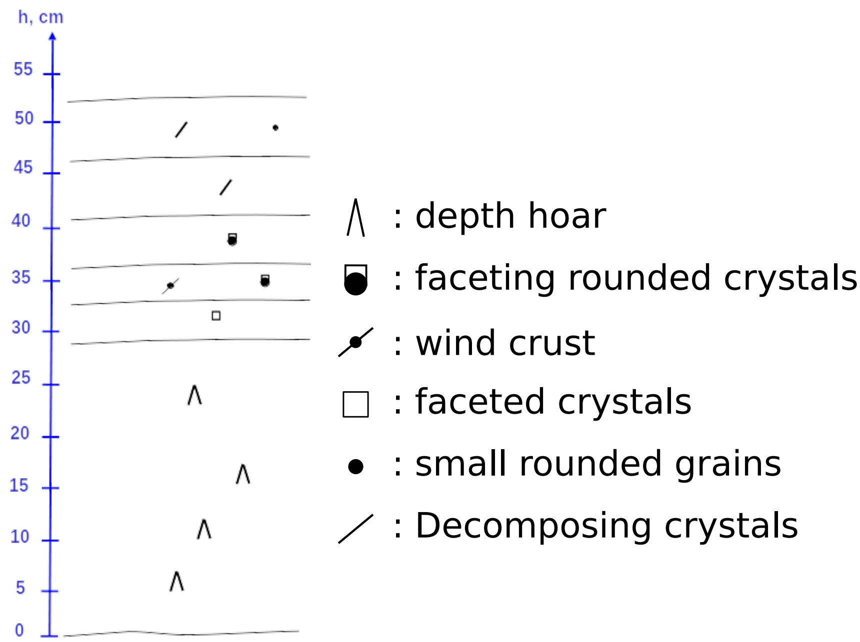
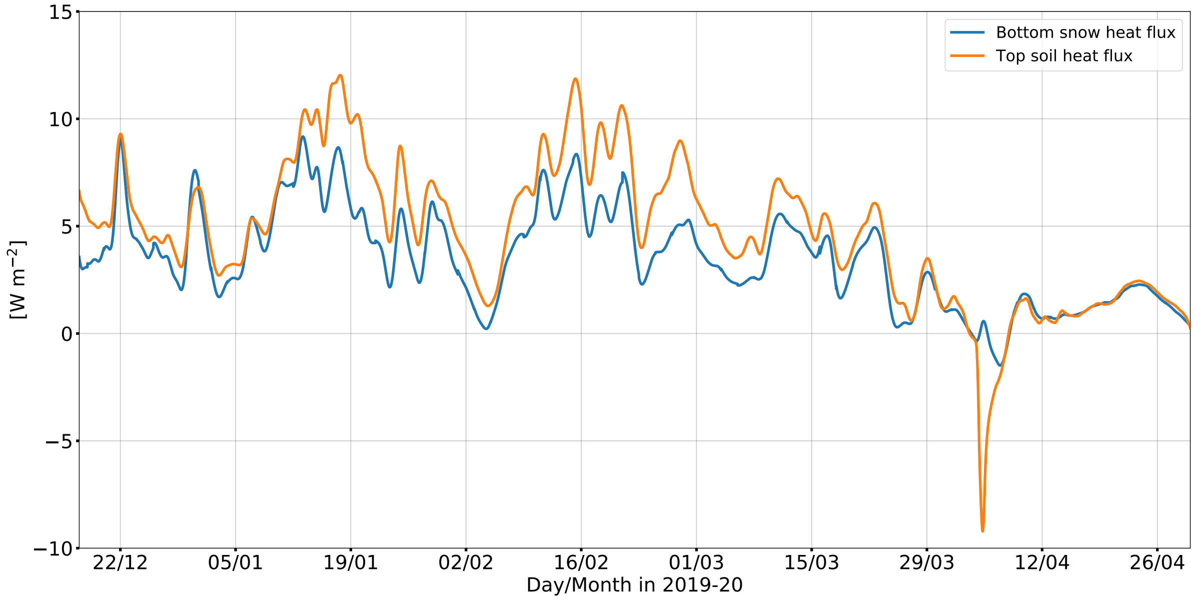


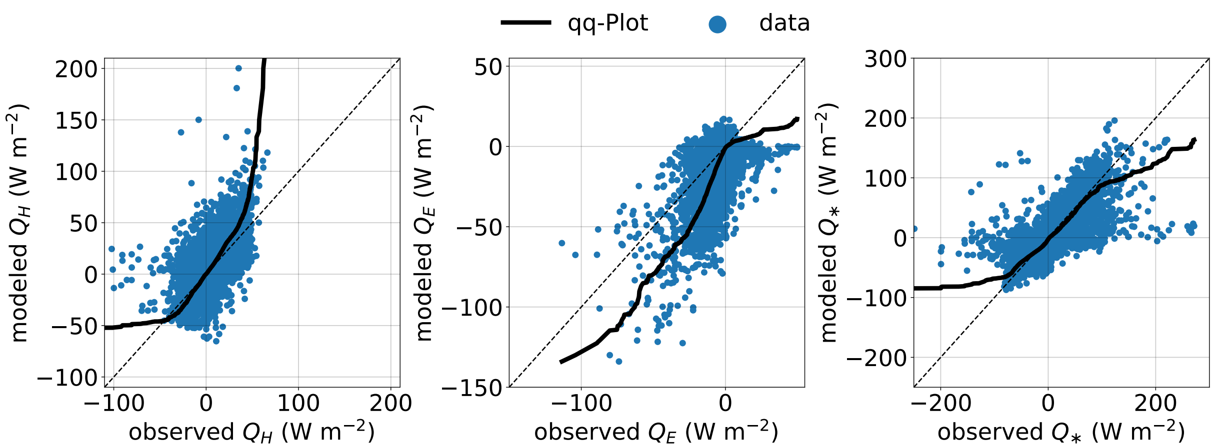
Supplementary Figure 1: Profiles of snow density (blue) and thermal conductivity (orange) at the 22 March 2019. The simulated density profile at the same time is also shown.



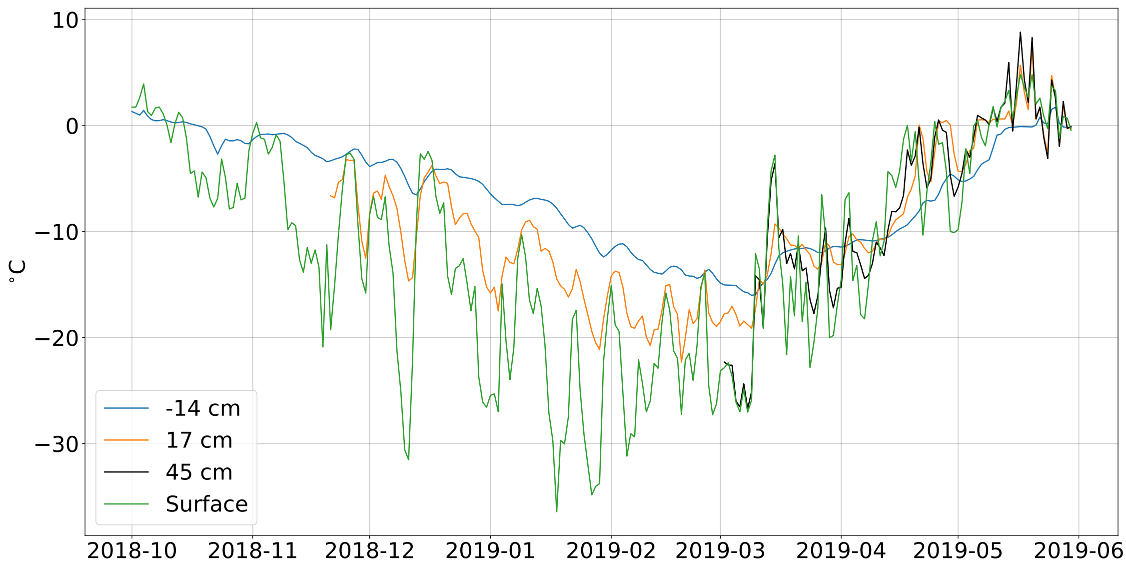
Supplementary Figure 2: Stratigraphy on March 22, 2019 corresponding to the density and thermal conductivity profiles shown in Supplementary Figure 1.



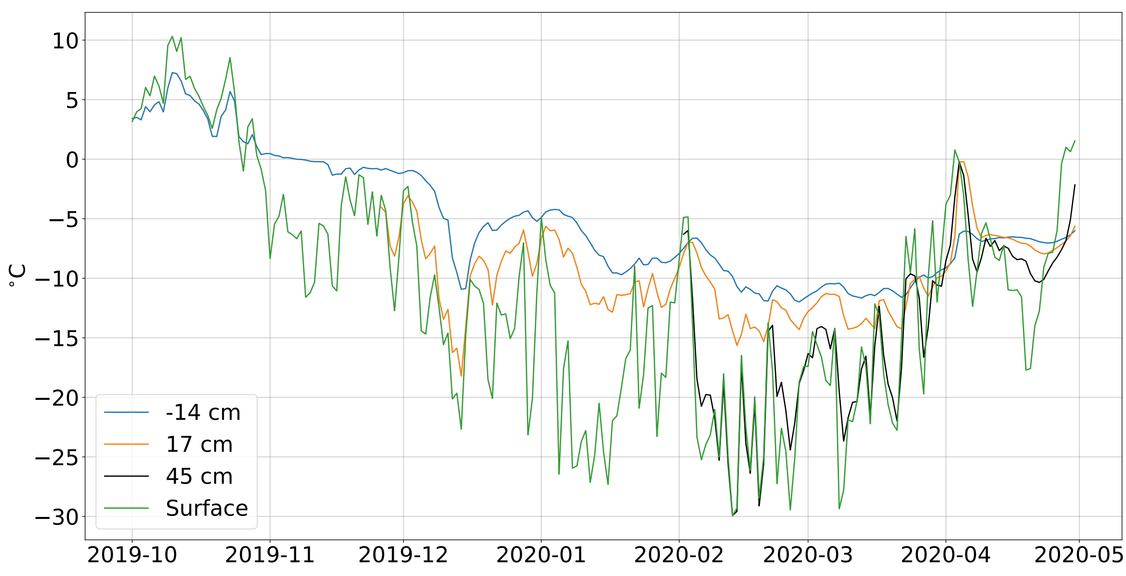
Supplementary Figure 3: Soil heat fluxes computed at a depth of 7 cm (orange) and snow heat flux computed 7 cm above the soil surface. Note that the large negative soil heat flux on 4 April corresponds to a rain-on-snow event. Positive values indicate fluxes from the soil to the atmosphere.



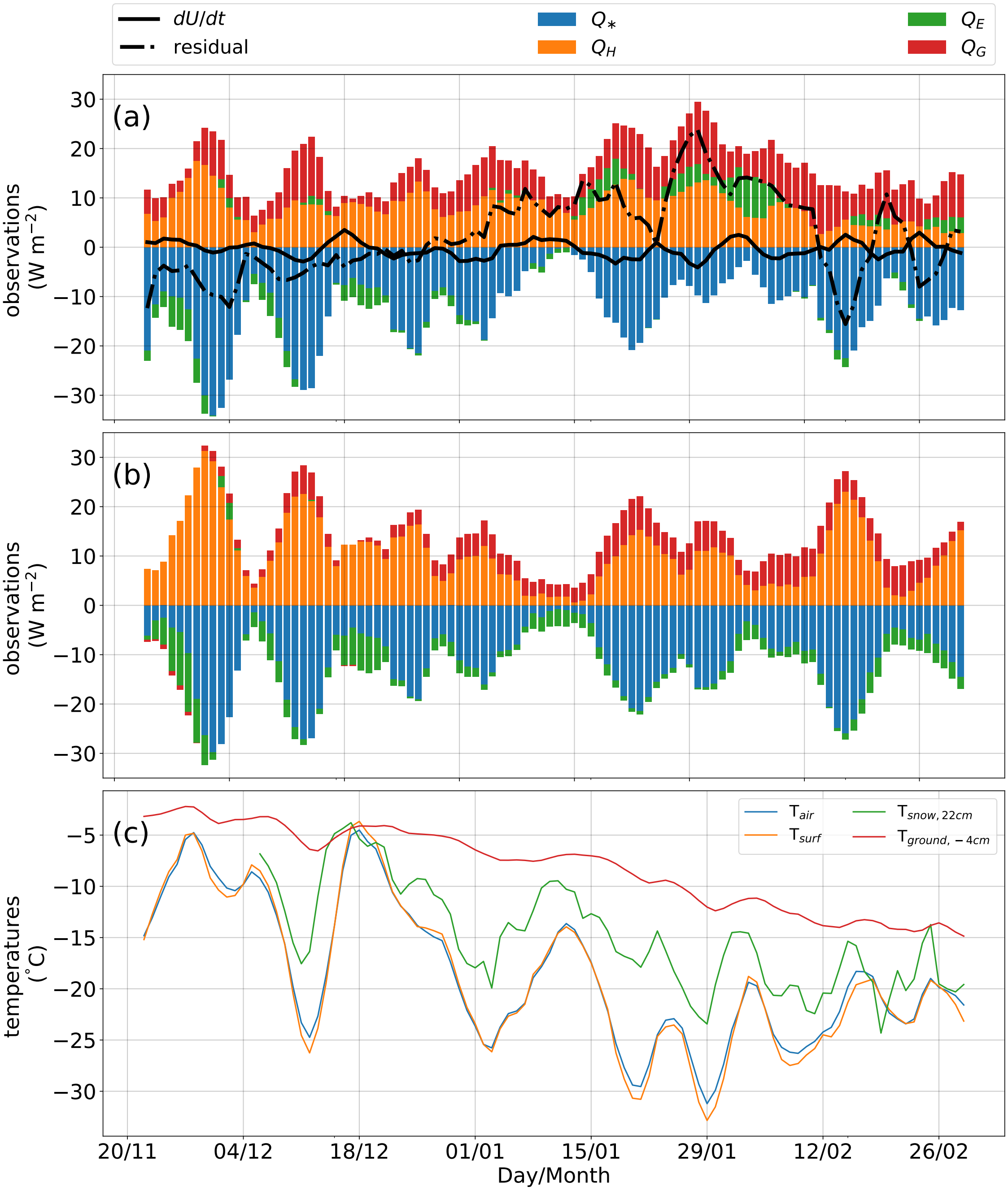
Supplementary Figure 4: Comparison between hourly means of modeled and simulated Q_H,Q_E, and Q_* for all three study winters. Overlain is a quantile-quantile plot.



Supplementary Figure 5: Temperatures of the ground (at 14 cm depth), the snow (at 17 and 45 cm height), and at the snow surface during winter 2018-19.



Supplementary Figure 6: Temperatures of the ground (at 14 cm depth), the snow (at 17 and 45 cm height), and at the snow surface during winter 2019-20.



Supplementary Figure 7: a) Observed and b) simulated daily snowpack energy budget terms comprising sensible (Q_H) and latent heat fluxes (Q_E), net radiation (Q_*), ground heat flux (Q_G), and the change in the internal energy of the snowpack dU/dt, during the first half of winter 2018/19. The modeled ground heat flux also includes the heat storage change dU/dt in the snowpack. The modeled snow enthalpy change is not shown because the modeled enthalpy includes changes due to precipitation and is therefore not comparable to observations. In the lower panel c) the temperatures of the air, the surface, the snow and the ground are shown.