



## **Improved radiation transfer and energy balance simulations at Summit/Greenland using the SNOWPACK model**

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Energy exchange between snow cover and atmosphere plays a key role in atmospheric boundary processes as well as in photochemical reactions in and above the snow cover. Studies on these topics rely heavily on snow cover models as a lower boundary condition. However, snow models in use provide mostly very simplified and inaccurate assumptions on the snow stratigraphy and radiation transfer depending thereon. This contribution introduces the Swiss snow cover model SNOWPACK with a novel energy balance/radiation transfer scheme (Mie/ray tracing in combination with a discrete ordinates multiple scattering model) and its capability to serve as a reference snow model in studies on snow/atmosphere exchange processes. A comparison between measured radiation fluxes and the SNOWPACK model shows the superior performance compared to simple model approximations. Moreover SNOWPACK-simulated albedo is compared to measurements and shows promising results. Along with these comparisons also a simulation of the snow cover evolution during summer 2002 at Summit/Greenland is presented. We believe that our model approach can be valuable not only for Arctic/Antarctic studies on snow/atmosphere processes but also for applications on seasonal snow covers.