

2008 Fall Meeting  
Search Results

Cite abstracts as **Author(s) (2008), Title, *Eos Trans. AGU*, 89(53), Fall Meet. Suppl., Abstract xxxxx-xx**

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HR: 0800h

AN: **C21C-0568**

TI: **AN IMPROVEMENT OF SNOW PARAMETERIZATION IN ORDER TO BETTER REPRESENT SOIL TEMPERATURES**

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AB: The snow cover commonly exhibits large vertical gradients in terms of temperature, density, and water content. In order to take into account such variability many models represent the snowpack with multilayer schemes, normally using thinner layers near the surface, and with thicker layers downwards, since the largest gradients occur at the atmosphere interface. However, in deep alpine snowpacks it has been found that such parameterization may not well describe the heat flux exchanged between the snow cover and the soil. In particular, if the thermal conductivity at the layer interfaces is modelled with an harmonic mean, having a deep snow layer and a neighboring thin soil layer may result in a very small thermal conductivity, and, consequently, a strong underestimation of the snow-soil heat flux. This heat flux component has actually a very important implication in the thermal and hydraulic regime of permafrost and seasonally frozen ground, especially during the melting season, when the snow disappearance time should be carefully described, and, therefore, it should be carefully determined. This work shows that a symmetrical discretization of the snow with thin layers located at both extremities of the snowpack considerably improves the soil temperature modelling. For example, representing the snow cover just with three layers, of which the upper and the

lower particularly thin, could be a good compromise between computational speed and model precision. This new parameterization has been included in the GEOtop model, a physically based hydrological model that jointly solves the water and soil energy balance for snow and soil. The model has been applied to a heavily instrumented site in the Swiss Alps (Murtel Rock Glacier) showing good results.

DE: 0702 Permafrost (0475)

DE: 0704 Seasonally frozen ground

DE: 0736 Snow (1827, 1863)

DE: 0764 Energy balance

DE: 0798 Modeling

SC: Cryosphere [C]

MN: 2008 Fall Meeting

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