

Interactive
Comment

Interactive comment on “Application of asymptotic radiative transfer theory for the retrievals of snow parameters using reflection and transmission observations” by H. S. Negi et al.

H. S. Negi et al.

negi_hs@yahoo.com

Received and published: 7 June 2011

Response to M. Gergely

1. Yes, we agree with your remark for AFEC comparison by two different theories that angular dependence of scattering is not crucial in the calculation of AFEC from spherical albedo and global transmittance as shown in the present case. But the angular dependence is important if one uses the reflectance and transmittance data to retrieve AFEC and other parameters. Also AFEC itself strongly depends on the asymmetry parameter. The asymptotic theory is based on the thorough analysis of the asymptotic behavior of the radiative transfer equation and has larger domain applicability as com-

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper



[Interactive
Comment](#)

pared to (e.g., two-flux) approximations used before. Also the equations are simpler and the analytical inversion of simultaneous reflection and transmission measurements is possible in the framework of asymptotic theory and this is not possible in the formulation presented by Dunkle and Bevens (1956) .

2. The experiments were conducted on a natural snowpack having different homogeneous layers of snow with various thicknesses. Here we agree that in case of thin snow layers we have the average grain size and density of the snowpack. But if there is a completely homogeneous snowpack (which is difficult to get in nature for most of the time) it will be possible to retrieve the optical parameters for that type of snow. However, the aim of this paper is to show the first application of the asymptotic radiative transfer theory for determination of various snow optical characteristics from simultaneous snow reflectance and transmittance measurements. This was not done before.

[Interactive comment on The Cryosphere Discuss., 5, 1239, 2011.](#)

[Full Screen / Esc](#)[Printer-friendly Version](#)[Interactive Discussion](#)[Discussion Paper](#)