The Cryosphere Discuss., 4, C1583–C1585, 2011
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The Cryosphere Discussions

Interactive comment on "Retrieval of snow albedo and grain size using reflectance measurements in Himalayan basin" *by* H. S. Negi and A. Kokhanovsky

Anonymous Referee #2

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Comments

They did a pretty good job for field snow measurements in the Himalayan Basins and obtained consistent results with other field measurements in literatures and confirm theoretical predicts of snow optic properties. It's a good contribution to the snow research community and deserves being published in Cryosphere. However, I feel the theoretical and method sectiosn in this article could be much conciser. Other minor changes are also needed in order to make the article being easily read. Please address the following comments.

Table 1. Type I snow grain size from 9:30 to 12:20, the snow thickness decrease from

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27 to 22 cm, Quesiton 1: what is the major reason for snow depth decrease, snow melting or snow metamorphism? snow surface T increase from -2.0, -1.5, to 0.0 dgr, and the Grain size also increases from 0.0- 0.5, 0.5-1.0, to 1.0-2.0 Questions 2, in the afternoon and even in evening, when the snow T decreases to -2, what snow grain size will be?

P.5 L.8-10, why did not you list the broadband albedo measurements on Feb 27-28, 2006, in Table 1?

In the article, you talk about the ART retrieved abedo, which also confused me with the field measured albedo (spectal and broadband). Sugget changing "retrieved albedo" as "simulated albedo" or changing to "ART retrieved albedo".

Figure 4: retrieved plane albedo vs field measured spectral albedo, what are their difference? Clarified in the figure caption, which make your figure stand alone and easily read.

Figure 6, I do love figure 6, which shows the dependence of snow albedo on solar zenith angle, please add references:

1. Liu, J., C. Schaaf, A. Strahler, Z. Jiao, Y. Shuai, Q. Zhang, M. Roman, J. A. Augustine, and E. G. Dutton. 2009. Validation of Moderate Resolution Imaging Spectroradiometer (MODIS) albedo retrieval algorithm: Dependence of albedo on solar zenith angle. J. Geophys. Res., 114, D01106, doi:10.1029/2008JD009969. 2. Wang, X. and C. Zender. 2010. MODIS albedo bias at high zenith angle relative to theory and to in situ observations in Greenland. Remote Sensing of Environment, doi:10.1016/j.rse.2009.10.014.

Figure 7. What is difference of (a): integrated albedo using field measured spectral albedo; (b) integrated albedo using plane albedo retrieved from reflectance measurement data? Change the figure caption to clarify it.

P.15. L18-24: this is very critical observations which confirm other field measurements

TCD

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and theoretic predictions.

P16, L.18-19: "The retrieved integrated albedo was found within ±6% difference error from ground observed broadband albedo". I do not like the word "error" because it is just the difference of two methods. Similar at other places, I would like to remove the "error" and use "differences". e.g., "standard error (RMSE)", -> "standard difference (RMSD)".

Interactive comment on The Cryosphere Discuss., 4, 2337, 2010.