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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 #1

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General Comments: This is a very good paper that carefully explains a modelling experiment to estimate snow albedo and effective snow surface grain size of seasonal snow in the Himalayas. The authors introduce the topic and then describe the modelling methodology before discussing the results. Results for the snow albedo are impressive: the retrieved integrated albedo was within $\pm 6\%$ of measured albedo and the grain size estimates using ART theory are consistent with measurements. Overall, the research contribution will assist the understanding of satellite remote sensing observations of snow in high mountain terrain. My main criticism is that the grammar and turn of phrase need improvement to ease readability - clearly this is a technical paper but it needs to be edited further to improve its presentation, especially in the sections

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that bookend the technical mathematical description of the model. The conclusions are reasonable and are consistent with the results.

Specific comments: P2339 (section 1 - introduction) The authors imply that snowfall during the winter melts during the summer. While this is undoubtedly true for much of the snow, not all the winter snowfall melts since much of it remains as perennial especially at high altitude. P2339. The authors describe the three different zones for the Himalayan mountains. On what data/study are these zones based? It would be useful to include a map demonstrating the spatial extend of these regions. P2339: The authors discuss the need to estimate grain size, and, indeed, the paper explores substantively grain size estimates. But, they also need to state that they seek to estimate surface grain size only (this work does not seek to estimate vertical variations of now grain size in the pack). P2340. The authors need to explain fully why the locations for sampling were chosen - what significance did these sites have? And why were the locations different? P2340 On line 12-13, the authors state that "the experiments were carried out within 5-10 minutes to minimize the atmospheric effect on snowpack". within 5-10 minutes of what? This does not make sense. P2340 The grain size measurement protocol needs to be fully explained. How many grains ? WHat about surface crust features (wind blown etc)? P2341 at end of the introduction. A map should be included of the study location.

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

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