**Biogeosciences
Discussions**

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Comment

Interactive comment on "Reflectance properties of selected arctic-boreal land cover types: fieldmeasurements and their application in remote sensing" *by* J. I. Peltoniemi et al.

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This study is a report on several field campaigns performed in different places (including Australia) with differing instrumentation measuring multiangular reflectance properties. It further contains a qualitative description of the measurements. The major part of the conclusions and discussions section are not based on information contained in the article and are not specific for the arctic boreal zone.

Given the limited material, poor description of methodology, and lack of coherence between results and conclusions, this article would not be publishable in a similar ranking remote sensing journal. It is in contrast to high-quality, quantitative material on the

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reflectance properties of boreal land cover types by earlier studies (see some references below, especially studies in the framework of BOREAS), extensive modelling studies including empirical data, and the existing sophisticated approaches to process multiangular measurements (e.g. Dangel et al., 2005, Lyapustin and Privette, 1999, Martonchik, 1994). Some major issues are described below:

1) Lack of aim and focus a)It remains unclear what goal should be reached by the study. b) Title mentions boreal areas, but the authors only cover the understory and snow, but omit the boreal forest (i.e. trees) which is the most important land cover type and currently most challenging research area (esp. interaction with snow). On the other hand, Australian grasses are included. c) Mix of description of instrument, methodology, and database which all do not include enough detail to be reproducible, followed by an extensive conclusion where major parts are not specific for the boreal area nor based on the presented material.

2) State of the art of boreal ecosystem reflectance measurements, multiangular reflectance measurements in general, and data processing for databases, reproducibility a) Missing most important references on multiangular reflectance measurements of boreal land cover types (not a single BOREAS reference!) and snow (see for example Painter references below). b) Terminology and processing of multiangular field measurements to obtain BRDF are very poor (i.e. field measurements as described correspond to HDRF or HCRF, only after processing them (usually based on sun photometer data and a modelling approach) the data correspond to the bidirectional configuration. It remains unclear how the authors corrected for the diffuse illumination and to which cases this was applied. Some references describing terminology and processing are listed below. c) The assumption of constant solar angles does not hold true when measurements take 60 min. d) The authors state that the expansion applied to the data (eq. 2 + 3) is only used as a presentation and averaging tool and does not fit the observations well. BRDF models are available and it remains unclear why the presented data (incl. albedo) are based on the simplified approach. e) The database is

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only useful when full instrumental description is available and processing methodology is reproducible - this study uses different instruments without mentioning any implications this might have for the comparability of the measurements. f) Example for poor reproducibility: p. 1074 'data were checked, cleaned and stored in a database. Depending on case, the measured intensity..' and 'diffuse skylight is subtracted optionally' - there is no indication under which circumstances the above treatments were applied and how they are performed.

3) Additional comments a) The article is prone with subjective comments which are not based on any references or results. For example, the authors claim in the introduction that remote sensing community is steps behind carrying out systematic experiments and developing verified theories and models, while citing references of co-authors covering exactly this area. b) General quality and significance of graphs is poor. Example: in Fig. 4 axes are not adapted to data values (data exceeding the max. range of the y-axis).

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