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The Cryosphere Discussions

Interactive comment on "Mapping radiation transfer through sea ice using a remotely operated vehicle (ROV)" *by* M. Nicolaus and C. Katlein

Anonymous Referee #1

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General comments:

In this paper, a methodology is described for measuring transmittance through sea ice along transects. Experience is reported based on several campaigns during a cruise traversing the Arctic Ocean. The background is described of the derived data set that, laudably, the authors made publicly available. The paper is well written. However, data analysis is rudimentary. While an empirical procedure is suggested (and applied) to reference irradiance data to a common level beneath the sea ice bottom, discussion is missing of radiance and irradiance corrections due to pitch and roll of the remotely operated vehicle (ROV).

For what it is, this manuscript is a useful reference for future, related work, and for the data set acquired. However, data correction for pitch and roll should be discussed.

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Specific comments:

The conclusion that the emerging light field received at the ROV is not isotropic is not supported by the data as presented. There is only a comment made in passing that this is not the case but since nothing is exact in field measurements, more elaboration is needed with regards to data analysis and errors (e.g. regarding pitch and roll).

It is not made clear how the empirical method (scaling measurements to a particular depth) depends on the sea ice properties above the ROV. To what extent would this need to be considered if sea ice optical properties changed along a transect? Is this an issue in the presented dataset? For example, if the distribution of radiance is affected by the presence of meltponds and holes in the ice, this would presumably affect the relationship between extinction and depth.

I suggest the term transflectance not be used to describe the ratio of radiance detected at the ROV and solar irradiance above the ice.

Nomenclature seems inconsistent: are EDt and Ed,u the same thing? Similar for IDt.

Interactive comment on The Cryosphere Discuss., 6, 3613, 2012.