The Cryosphere Discuss., 6, C1970–C1971, 2012
www.the-cryosphere-discuss.net/6/C1970/2012/

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 #3

Received and published: 25 October 2012

Review of manuscript entitled "Mapping radiation transfer through sea ice using a remotely operated vehicle (ROV)" by M. Nicolaus and C. Katlein.

This manuscript describes measurements of light transmittance through sea ice covers sampled at multiple stations across the Central Arctic. Transects of light transmittance and "transflectance" were recorded over variable paths at each station. This paper describes a new methodology for collecting transmittance data beneath sea ice and presents a data set that was carefully collected and appears to be of very high quality.

I think the methodology, as described, is quite useful. The data set, perhaps less so, as it is of limited use. It is difficult to extract scientific advance from this analysis as there is not a full complement of attending physical property characterization.

Minor comments: p 3619, line 17: why "(south)"?

p 3622, line 9 -10: this seems like a difficult measurement to make beneath a horizontally inhomogeneous ice cover– what happens when the deeper irradiance measurement includes light propagated through the edge of a neighboring melt pond (or ridge), whereas the shallower measurement does not include that feature in its field of view? Seems it would be possible to under- (or over-) estimate extinction coefficients for the intervening water depending on the details of the spatial variability of the ice. Ideally, this measurement could be made more reliably with a narrow field of view radiance detector, but then it is difficult to correct irradiances.

p 3623, line 19 - 20: I think the authors would be wise to take care in using statements like "most comprehensive" and "most unique". These are difficult to substantiate.

p 3624, line 1-2: Sentence beginning "Also, only the direct access..." Please re-write this sentence for clarity; I do not understand what it means as it is presently worded.

p 3625, line 26 - 27: "it can be shown that light transmittance is generally lower for MYI than for FYI". Is this result corrected for differences in ice thickness? This is either an obvious statement that is tightly correlated to fact that selected MYI was likely thicker than selected FYI, or else it is an interesting result that is not substantiated by the limited data analysis that is presented.

Are the data presented in Fig. 7 corrected for extinction by the intervening water? Please state in the discussion of this figure.

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