

Interactive comment on “Arctic clouds and surface radiation – a critical comparison of satellite retrievals and the ERA-interim reanalysis” by M. Zygmuntowska et al.

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Received and published: 9 February 2012

We would like to thank Karl-Göran Karlsson and his colleagues Adam Dybbroe and Abhay Devasthale for the useful comments regarding some missing information in our manuscript.

We try to address the raised issues in the following sections and include the missing information in our paper.

The first concern raised by K.-G. Karlsson is a lacking acknowledgement and reference to the NWCSAF PPS algorithm developed and described by his colleagues and him (Dybbroe et al. 2005). The paper by Kasper et al. (2009) we referred to is a rather
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general reference, describing the dataset only briefly. We will implement therefore his suggestion in the paper and refer to the mentioned publication.

Further K.-G. Karlsson argues that our paper basically reports results that have already been published by him and his colleague in ACP 2010 regarding the performance of the CMSAF scheme in Arctic conditions. In the mentioned study he and his colleagues used only data from 2007, three months in summer and one month in winter. First of all this is a rather small basis and secondary it has been shown in various studies that 2007 might have been rather an unusual year when it comes to clouds and the cloud radiative effect in the Arctic. Even though this is not confirmed in our analysis we believe that our results provide new and more reliable information about the performance of the two datasets. We will acknowledge the mentioned publication in our paper.

He also raises the issue of missing a cloud definition for the three data sets analyzed in our paper, in particular for the Era-Interim data set. He and his colleagues suspect that the high cloud amount reported by Era-Interim might be explained by the fact that there is no restriction about how thin clouds can be. To our knowledge there seems indeed be no restriction as clouds in Era-Interim are described by prognostic equations for cloud liquid water/ice and cloud fraction. However, we try to assess any possible bias by comparing the PDF from the cloud water content from Era-Interim and the one from the microwave radiometer during SHEBA. We found no substantial difference between these two data sets which could confirm their speculation.

We thank further for the interesting information that the AVHRR data from CMSAF is about to be updated in the beginning of 2012. The updated data set covering the period from 1982-2009 will include appropriate calibration corrections which have not been applied before. As mentioned by K.-G. Karlsson this may result in interesting improvements for the cloud and surface albedo conditions in the arctic summer. We will mention that such a dataset is underway, and what improvements this may lead to.

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Interactive comment on *Atmos. Chem. Phys. Discuss.*, 11, 31495, 2011.

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