

Interactive comment on “In-situ sounding of radiation flux profiles through the Arctic lower troposphere” by Ralf Becker et al.

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Received and published: 22 June 2018

Thanks for the comments and encouraging suggestions !

The discussion on cloud radiative properties here is based on a sequence of four subsequent profiles only. All results presented provide a characterisation of this individual situation. It should be noted that tethered ballooning cannot be performed to obtain multi-year datasets (as described in the study you are referring to), but for case studies.

More data on microphysical properties of the sensed clouds would be beneficial to get more realistic simulation results. Recently, Alfred-Wegener-Institute started operation of cloud radar at Ny Alesund site.

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We managed to keep uncertainties in the fluxes as small as possible to get realistic heating rates by selecting best hardware, i.e. using instruments operated in the BSRN context. Both instrument types - pyranometer and pyrgeometer - are linked to the world standard group/world infrared standard group by its calibration procedures. Concerning the misalignment during flight it can be said that the mean deviation in sun zenith (calculated minus observed) is about 1.8° for the four profiles. Thus, misalignment can be neglected for the diffuse radiative fluxes. For shortwave downward, facing sun zenith of about 60° , we get a correction term of 17 W/m^2 . Hence, after applying the correction it is assumed to get an uncertainty only marginally enhanced w.r.t. near surface observations. Parallel observations with mast-mounted fast sensors would help to further consolidate that.

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2018-173, 2018.

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