

Interactive comment on “Infrared emission measurements in the Arctic using a new extended-range AERI” by Z. Mariani et al.

Anonymous Referee #2

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The paper "Infrared emission measurements in the Arctic using a new extended-range AERI" provides a useful description of a ground-based emission FTIR spectrometer and includes a discussion of first results achieved with this instrument. The paper is well written and fits within the AMT scope.

List of minor comments:

Title: I'm not fully happy with the title, as important parts of the first results presented depend on the P-AERI already available at the site (e.g. Section 4.2, 4.4). (It is not just used to calibrate the new E-AERI.)

The abbreviation "UW blackbody" is not introduced. UW again stands for University of

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Wisconsin?

Section 2.1 It does not become clear to me which components constitute the "back-end" of the setup. First, a "back-end electronics" is mentioned, further down in the text it is revealed that "electronic modules are also mounted in the back-end". Finally, it is stated "the back-end, where the interferometer is located..."?? Please improve this text section, a drawing of the setup would also be of great help to the reader. (Which optical and electronic components comprise the front-end optics, the interferometer, and the back-end? Where is the field stop located?).

Questions concerning the 45° scene mirror: A) Which reflectivity of the mirror can be achieved and maintained? B) Table 1 lists among the E-AERI instrument performance "Polarization < 0.1%". What does this mean? Is this the degree of polarization the scene mirror imposes on unpolarized radiation? B) How the mirror is kept free from e.g. ice crystals under the harsh polar conditions. Is a steady hot air flow applied? Is there an IR transmitting optical window between the inside of the lab and the scanning mirror outside?

Section 2.4 Please provide the estimated emissivity of the blackbody sources. Both blackbody sources (hot and ambient T) provide significantly higher radiance than the cold dry polar atmosphere in the window region. This might impact the calibration, especially if the beam-splitter self-emission is not negligible?

Section 2.6 Table 2 is very technical and requires additional explanations (e.g. additional column with explanations) to be useful for the reader. What is e.g. "LW HB NEN"?

Section 4.3 Is the CKD2.4 continuum compatible with the HITRAN 2008 line list?

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