Geosci. Instrum. Method. Data Syst. Discuss.,
doi:10.5194/gi-2015-43-RC1, 2016

Geoscientific Instrumentation Methods and Data Systems Discussions
Open Access
EGU

Interactive comment on "Optical laboratory facilities at the Finnish Meteorological Institute – Arctic Research Centre" *by* K. Lakkala et al.

Anonymous Referee #1

Received and published: 14 March 2016

A) General comments

The manuscript is a clear description of the FMI calibration facility at Sodankylä, Finnland. It explains in full details dark room labor and the different available setups. The clear technical content of the descriptions are most valuable as guideline for similar laboratories and act as reference for scientific work performed at this artic research center.

B) Specific scientific comments

All technical parts of the different calibration and measurement procedures are well descripted; however the paragraph of the control circuit of the irradiance standard lamp is not easy to follow and needs to be rewritten to improve the quality of the manuscript:

Printer-friendly version

Discussion paper

The control of the current passing through the lamp is the most important step for absolute irradiance calibrations. The traceability of this value is usually obtained through a calibrated resistor and a calibrated voltages measuring device (DMM). This should be clearly explained in the corresponding paragraph.

At FMI Sodankylä, the lamp current is acquired by the voltages measurement (HP3458A) over the reference shunt (Burster 1282, 0.1 Ohm). The details of the calibration of these devices (frequency, uncertainty) could be given. Using thie current value the software controls the lamp current via the power supply (HP6675A). The current uncertainty is finally the combination of the reference devices uncertainties (Shunt and DMM) and the feedback precision.

The reason for the additional devices is unclear: What is the current-to-voltages converter? Looking at the schematic (Fig. 1) it is a looks more like a simple voltage measurement performed from the Data Logger QLI50. This value is a result of the current regulation and thus interesting as a long term stability and quality criterion for the lamp in use.

Finally: What is the fine tuning procedure and what is its purpose?

C.) Presentation

The manuscript is clearly structured. Minor modifications are recommended to improve the quality of the paper:

Page 3, line 7: (Typo) Internation -> International

Page 3, line 17: Reference to the manufacturer ADS Inc.

Page 3, line 4: (Typo) “current passes through the lamp” whereas “Voltages is measured over the lamp”. The HP6675A specifications are 0-120V and not 0-12V.

Page 5, line 15: Reference to the manufacturer of the QLI50. I could not find this instrument.

Page 5, line 22: (Typo) T +20 C±250 C -> Probable +-2.5 degC ?

Page 6, line 21: Define “X minutes”

Page7, line 21: (Typo) “the Spectralon . . .” -> “a Spectralon. . .”

Page 8, line 26: IHP = “Improving Human Research Potential”, Reference missing

Captions on the Figures are to short; more information is needed. The illumination of the photographs could be much improved.

Figure 1: . . . the electrical circuit. . .

Figure 2: For users who have never seen a brewer irradiance calibrations: The lamp inside the lamp holder is not visible. The Brewer is the white box with the quartz entrance dome seen in the bottom left corner. Indicat the locations of the different devices(lamp in the holder, Brewer, baffle, alignment assembly, Monitor diodes. . ..)

Figure 3: NILU - bottom white, Lamp unit – black top. . .

Figure 4: What is the light spot on the wall? Where is the entrance of the cosine receiver?

Figure 5: Is there a baffle between the spectroradiometer entrance and the reflectance plate? Unlucky angle of the photography.

Interactive comment on Geosci. Instrum. Method. Data Syst. Discuss., doi:10.5194/gi-2015-43, 2016.