The Cryosphere Discuss., 5, C934–C935, 2011
www.the-cryosphere-discuss.net/5/C934/2011/

The Cryosphere Discussions

Interactive comment on "Brief communication "Snow profile associated measurements (SPAM) – a new instrument for quick snow profile measurements"" *by* P. Lahtinen

P. Lahtinen

panu.lahtinen@fmi.fi

Received and published: 12 September 2011

The reviewer raises several good points.

The main motivation of the manuscript is to briefly present (hence the four page short discussion) the new measurement concept with some preliminary results (Fig. 2).

The geometry of the sensor setup is indeed vague and would need more verbose description. All the sensors located at the lower end of the shaft point sideways, that is horizontally at a 90 degree angle relative to the shafts axis. The IR thermometer has a field of view (FoV of 50 % thermopile signal) of 90 degrees centered at the optical axis of the sensor. Sensor (diameter of 0.58 mm) is 1.75 mm inwards from the optical

window. As the optical window is effectively touching the snow, the measured area is a circle of 3.5 mm in radius, which is equal to the size of the window. Angular response of other TAOS sensors using similar packaging as the TSL-230R irradiance sensor used here is close to a cosine curve. It is acknowledged, that the true angular response needs to be determined for detailed snow pack modeling.

The effect of the shaft is a known source of error. This is shown in Figure 2 and shortly mentioned in Chapter 3, but the explanation clearly needs expanding and a clearer version should be used.

Most of the proposed theoretical simulations can be substituted with real-world calibration measurements. In this way, the data can be used to validate the models and reveal possible shortcomings of each method. Author considers this a matter of future work, not to be included in this short manuscript describing a measurement concept.

Interactive comment on The Cryosphere Discuss., 5, 1737, 2011.