

## **New Instrument for Snow Profile Associated Measurements (SPAM)**

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A new instrument for Snow Profile Associated Measurements (SPAM) is presented. The instrument will be capable of determining snow depth, and also snow brightness temperature, layering and optical light transmittance of the snow on a sub-centimeter vertical resolution. With the new instrument snow profile measurements would be faster than the traditional snow pits, and thus larger number of samples could be collected in shorter time. The data would be valuable for snow pack modeling, both in microwave and optical wavelengths.

The instrument consists of a 1,2 meter long shaft with the sensors attached to the lower end, and of a processing unit with data logger, GPS and ultrasound sensor used as a depth reference. The sensor head has two sensors: IR thermometer for brightness temperature measurement, and a light intensity to frequency converter, which can be used to measure the transmitted irradiance of the sun light. By turning on the light source (LED) mounted next to the irradiance sensor, the reflected light can also be measured. By combining these two irradiance measurements, it should be possible to determine the snow stratigraphy, that is the layer structure of the snow.

The prototype unit was tested at Summit, Greenland during the RASCALS field expedition in July 2010. The first data collected from this expedition will be presented, and some modifications to the original concept are proposed.