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High Resolution Snow Depth Measurements Using Laser Sensors

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The new snow depth sensors works on the basis of laser distance measurement. This procedure enables the determination of the distance and the evaluation of the back-scattered intensity, which is a general indicator for the condition of the ground.
The high measurement precision of less than a milimeter when determining the distance to a fix target becomes “unsharp” only because of the applied statistical evaluation procedure, and the intrusion of the laser light into the snow surface. From this results a measurement precision that can be quoted with less than 5 mm. External influences such as temperature, wind or humidity do not have any effect on the measurement precision.

As a further independent measurement parameter, the amplitude of the backscattered signal is used and set in relation to the internal reference to determine the signal intensity. In this way, the different grounds (colours) can be distinguished. As the background brightness considerably contributes to the total error in the ground determination, only general classifications of the ground are enabled with simple means.

Measurements of the SHM 30 snow depth sensor are presented to show which statements and accuracies can be achieved at present.