

## Using data from automatic snow sensors for avalanche forecasting in Iceland

Harpa Grímsdóttir\* and Örn Ingólfsson

*Icelandic Meteorological Office, Avalanche Research Center, Suðurgata 10, IS-400 Ísafjörður, ICELAND*

*\*Corresponding author, e-mail: harpa (at) vedur.is*

### ABSTRACT

Real time data on weather and snow conditions are essential for avalanche forecasting. The timing and size of an avalanche depends on the amount of snow in the starting area, the stability of the snow as well as the triggering factor. Therefore, snow data directly from avalanche starting zones are a useful input to avalanche forecasting.

The avalanche forecasting team at the Icelandic Meteorological Office has relied on snow depth data from different types of snow depth sensors installed in avalanche starting zones for over 20 years. Since 2006, SM4 snowsensors have been tested and used as an important part of the avalanche forecasting system. The SM4 snowsensor was developed by a small innovation company in Ísafjörður, Iceland, POLS Engineering. The idea was to create a simple, robust instrument that could easily be installed within or close to avalanche starting zones. The SM4 consists of a 3 m cable with thermistors mounted at 20 cm interval on a wooden or fiber post and it uses the GSM system to transfer data. The raw output is a temperature profile, and based on that, an algorithm calculates snow depth in real time. The temperature profile within the snowpack is also of value for avalanche forecasting, since the metamorphism of snow crystals depends on the temperature gradient. Steep gradient indicates formation of facets within the snow cover, and facets are a common form of a weak layer in the Icelandic snowpack.

In the presentation, we will introduce the SM4 sensor and explain how the data are used for avalanche forecasting.