



## **Snow measurement system for airborne snow surveys (GPR system from helicopter) in high mountain areas.**

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In the hydropower industry, it is important to have precise information about snow deposits at all times, to allow for effective planning and optimal use of the water. In Norway, it is common to measure snow density using a manual method, i.e. the depth and weight of the snow is measured. In recent years, radar measurements have been taken from snowmobiles; however, few energy supply companies use this method operatively - it has mostly been used in connection with research projects.

Agder Energi is the first Norwegian power producer in using radar technology from helicopter in monitoring mountain snow levels. Measurement accuracy is crucial when obtaining input data for snow reservoir estimates. Radar screening by helicopter makes remote areas more easily accessible and provides larger quantities of data than traditional ground level measurement methods. In order to draw up a snow survey system, it is assumed as a basis that the snow distribution is influenced by vegetation, climate and topography. In order to take these factors into consideration, a snow survey system for fields in high mountain areas has been designed in which the data collection is carried out by following the lines of a grid system. The lines of this grid system are placed in order to effectively capture the distribution of elevation, x-coordinates, y-coordinates, aspect, slope and curvature in the field. Variation in climatic conditions are also captured better when using a grid, and dominant weather patterns will largely be captured in this measurement system.