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Acoustic emissions for the prediction of avalanches

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Although we know well enough the main zones where occur avalanches, the main difficulty results in forecasting avalanches because of the constant evolution of the snow coat. The coat, composed of various slopes have different properties according to the weather conditions not only during falls but also after. Weather modifications after snow falls generate instability of slopes which create stress, fissure and failure states. These different states generate acoustic emissions whose parameters can lead to forecast avalanches. The aim is to detect in situ these precursors, that initiate a low frequency signal. We have settled an experiment to monitor and register this signal. It includes two geophones to detect the acoustic signals, an acquisition system, one aerial of temperature sensor and a wireless connection to a deported PC. The system is controlled by ADSL in our offices. It will be shown on examples that any movement of the snow cap provides a signal. The rate of repetition of these elementary signals is the indication of an increasing instability of the snow precursor to an avalanche. By comparing the acoustic signals to temperature variation evolution of the snow pack we could define an alarm degree allowing to secure the area.