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Using hacked point and shoot cameras for time-lapse snow cover monitoring in an Alpine valley

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In Alpine environments, monitoring snow cover is essential get insight in the hydrological processes and water balance. Although measurement techniques based on LIDAR are available, their cost is often a restricting factor.

In this research, an experiment was done using a distributed array of cheap consumer cameras to get insight in the spatio-temporal evolution of snowpack. Two experiments are planned. The first involves the measurement of eolic snow transport around a hill, to validate a snow saltation model. The second monitors the snowmelt during the melting season, which can then be combined with data from a wireless network of meteorological stations and discharge measurements at the outlet of the catchment.

The poster describes the hardware and software setup, based on an external timer circuit and CHDK, the Canon Hack Development Kit. This latter is a flexible and developing software package, released under a GPL license. It was developed by hackers that reverse engineered the firmware of the camera and added extra functionality such as raw image output, more full control of the camera, external trigger and motion detection, and scripting. These features make it a great tool for geosciences. Possible other applications involve aerial stereo photography, monitoring vegetation response.

We are interested in sharing experiences and brainstorming about new applications. Bring your camera!