

# Swiss Experiment

Interdisciplinary Environmental Research

## HYDROSYS: in-area feedback developed on top of SwissEx technology

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### About Hydrosys

Hydrosys is an interdisciplinary EU project, bringing together partners from computer science, engineering, hydrology and natural hazards research.

**Aim of the project:** Development of a system infrastructure to support various user groups in fieldwork and to provide functionalities which will increase the quality and productivity of the research outcome.

**User groups:** natural resource management and exploitation e.g. natural hazards management, ski area operators, energy and water resource management, engineers and scientists.

**System integration:** integration of mobile, flexible field computers (handheld devices) and rapidly deployable sensors into a single sensor network developed according to the requirements of specific user groups.

**Handheld device functionality (Fig. 1):**

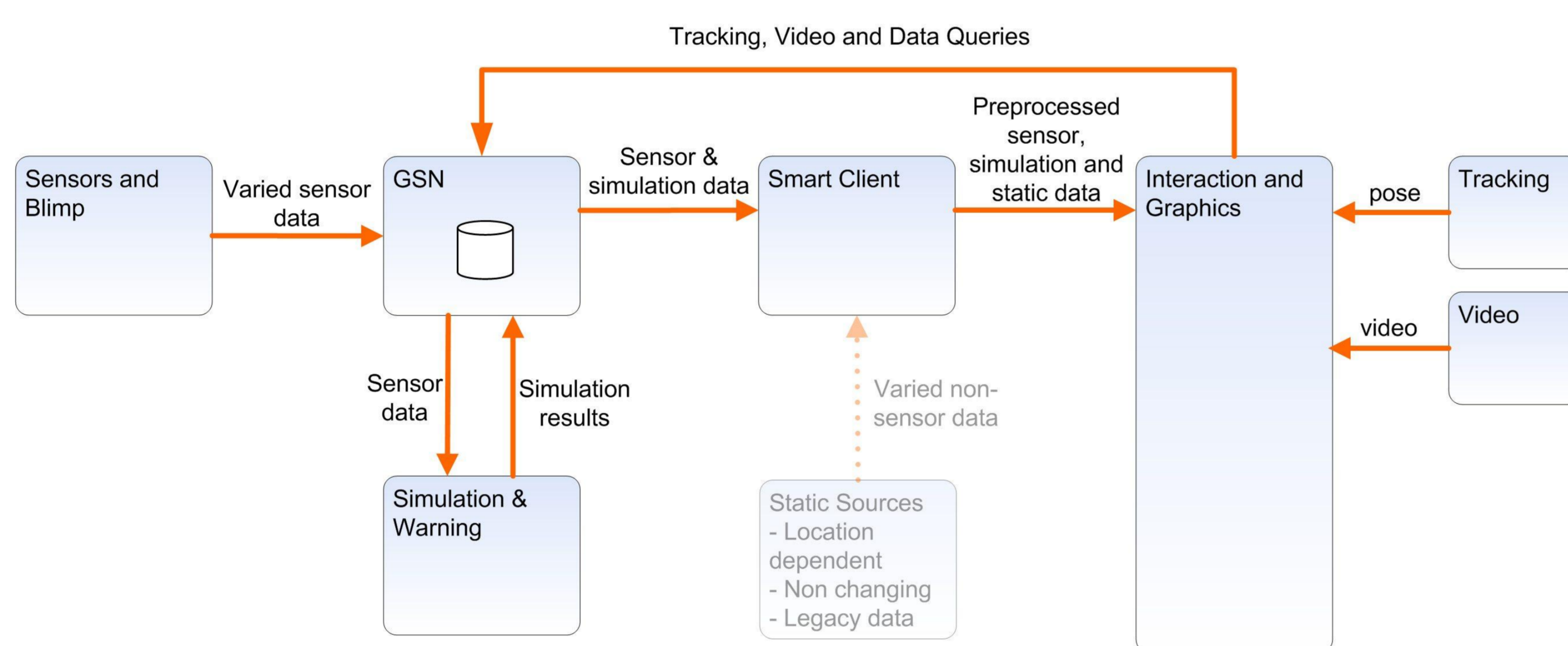
- Direct measurements
  - On-site triggering of simulation models
  - On-site visualisation of sensor data and model results using augmented reality
  - Real-time data transfer to other decision makers and interested parties
- Shared information platform enables quick reactions in critical situations



Fig. 1: Handheld device.

### Use of SwissEx technology

**System design:**



**GSN:** provides real-time data streams from multiple sensors as model input and delivers sensor data and model output to the users

**Sensorscope:** provides dense networks of meteorological sensor data

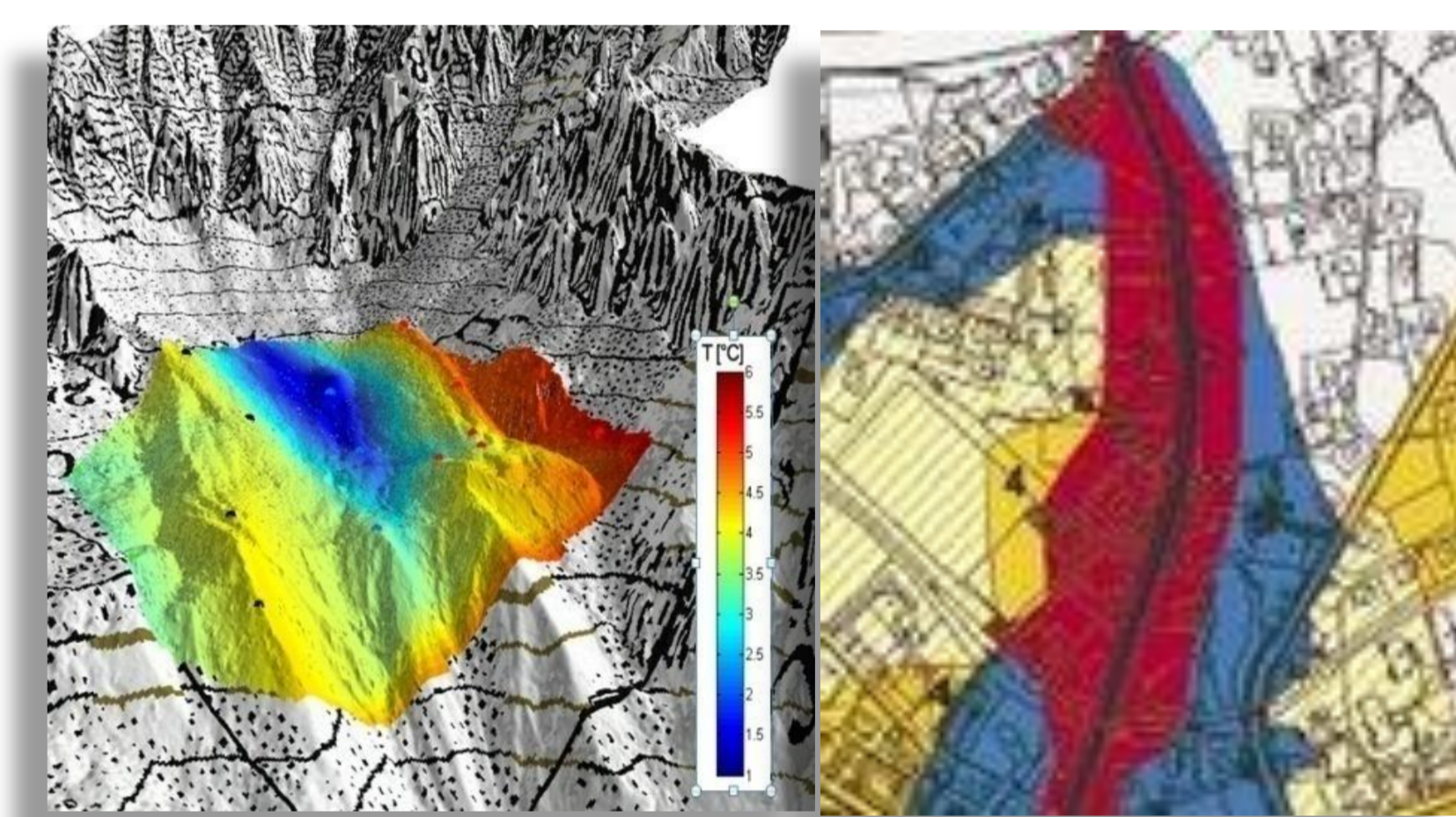


Fig. 2: Simulation results.

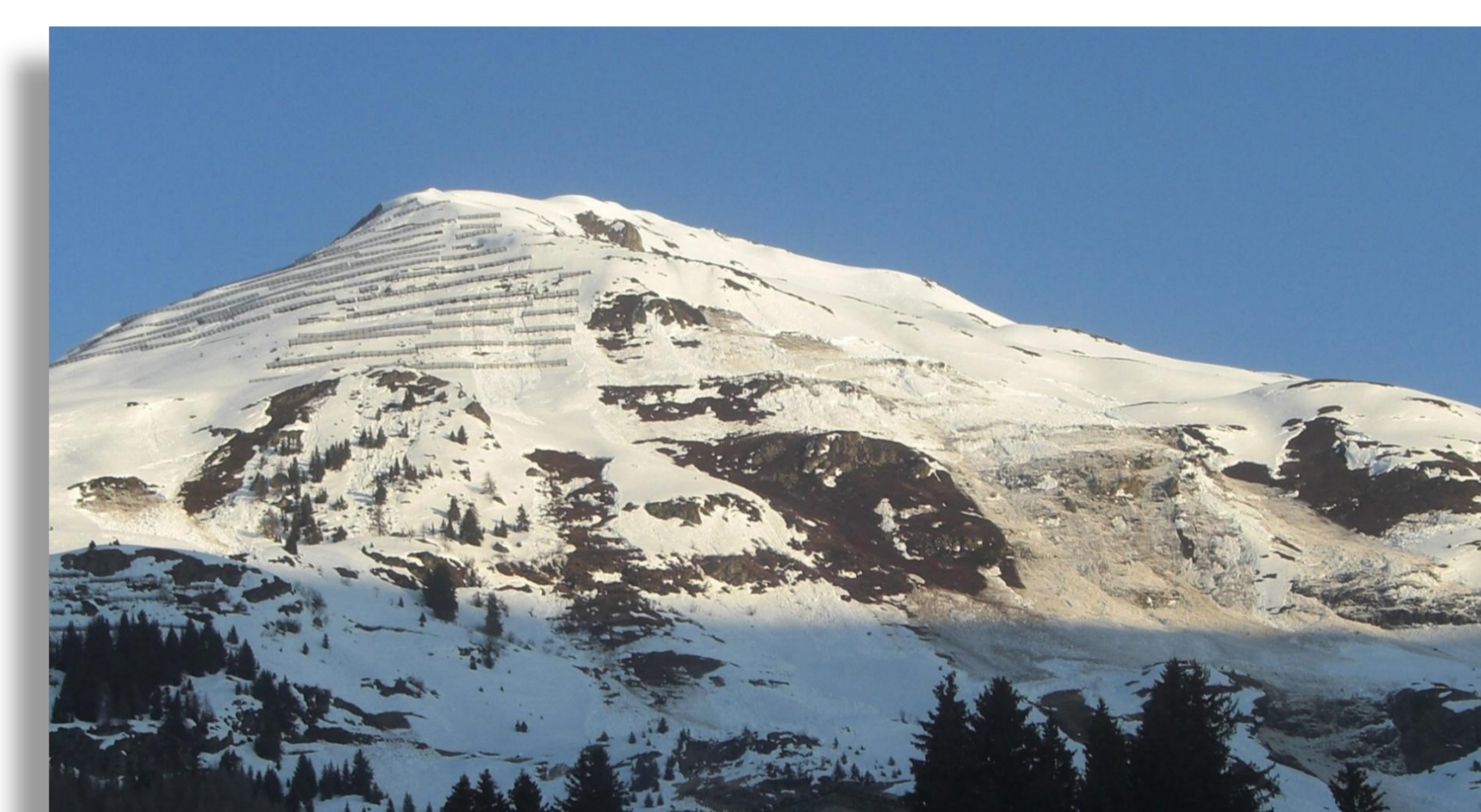
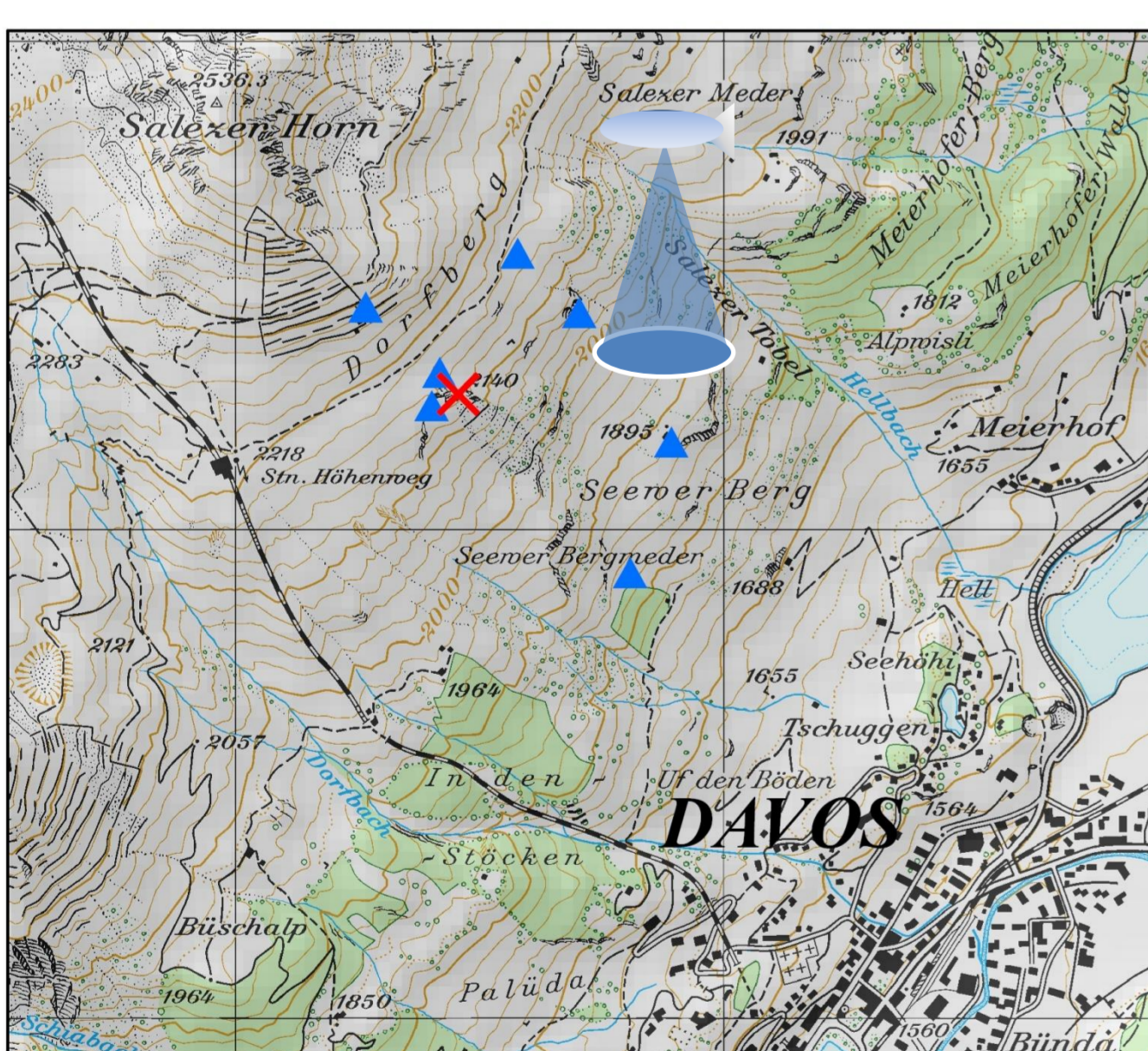


Fig. 3: Wet-snow avalanche.

### Application scenario



**Example:** one of three alpine application scenarios

**Impact:** Wet-snow avalanches have high impact but are poorly understood

**Aim:** Support of wet-snow avalanche research at test-site Dorfberg (Fig. 3; Davos, CH)

**Sensors:**

- Automated weather station (Fig. 4 ): TA, TSS, TS, HS, RAD, RH, VW, DW, LWC
- Seven Sensorscope stations (Fig. 5 ): TA, RH, SWR, VW, DW, LWC
- BLIMP: airborne thermal imaging
- Time-lapse photography
- Manual snow profiles and observations

**Handheld application:**

- Visualisation of
  - Sensor data
  - Simulation results (snow surface model Alpine3D) (Fig. 2)
- Direct measurement of snow temperature and snow water content (sensor)



Fig.4. Automatic weather station.



Fig. 5: Sensorscope station.

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[www.swiss-experiment.ch](http://www.swiss-experiment.ch)