ABSTRACT

The snow cover numerical model SNOWPACK Experiments carried out in Trentino Alto Adige in winter 2004/05

N. Radershall, C. Oberchmied, F. Gheser, M. Lehning

In winter 2004/05, a numerical model of the snowcover was used for the first time on three distinct sites within a series of tests carried out by the Avalanche Service of the Ufficio Idrografico of the Bolzano-Alto Adige Sudtirol province. The aim was to follow the snowcover evolution in winter months and gather information about the avalanche danger. The Snowpack model was used, which was developed by the Swiss Federal Institute for snow and avalanche studies (SLF) of Davos. The SNOWPACK is also being currently tested by other avalanche warning services in the Alpine chain, for example in Veneto, Tyrol and Bavaria. Starting from the meteorological data recorded by an automatic station, the model is able to calculate the snowcover behaviour near the station. The model also provides data on the snowpack evolution with time in the form of snow profiles. By continuously comparing the comparative measurements carried out throughout the winter months, a verification of the results provided by the model has been made which indicated how the model supplies useful data referring to its own structure. However results are mostly linked to the quality of incoming data and the correct model initialisation. Also, considering the lack of reliable parameters about the snow cover stability and the fracture load of weak layers, it is very difficult to turn these results provided by the SNOWPACK into accurate information about avalanche danger. In order to turn it into an instrument to be effectively used for avalanche prevention on the basis of simulated profiles, it is thus appropriate to continue research. The first results of these research works were discussed in autumn 2005 on the occasion of a workshop at SLF headquarters.

THE SIMPLIFIED SNOW PROFILE

R. Bolognesi

In this article Robert Bolognesi illustrates in detail the study he has carried out on simplified snow profiles, demonstrating that the evolution of this snow cover investigation method leads to fairly accurate acquisition of a large amount of essential information to evaluate the avalanche risk. The article clearly and simply explains the development procedure that, together with the results of the numerous measurement campaigns, leads to a comparative analysis with the traditional method.

As Bolognesi himself says, this technique, too, has some inconveniences, and it is right thanks to this accurate survey that a procedure already used in the past can be considered reliable.

Paolo Turcotti

RECENT TREND OF SNOW PRECIPTATION ON ITALIAN ALPS

M. Valt, A. Cagnati, A. Crepaz, G. Marigo

Recent papers showed a general decrease of winter precipitation in the last years on Italian Alps and particularly snowy precipitations, both in the Western Italian Alps and in the Eastern part. In the Dolomites snowfall decreased of 28% during the period 1988-2003, comparing with average precipitations in 30 years (1971-2000). In this paper it is carried out an analysis of seasonal snowfall in the Dolomites and first results of a regional climatic evolution using the adimensional index SAI (Standardized Anomaly Index) for 40 snow measurement stations on the Alps. Furthermore decreasing snow precipitations corresponds to a strong reduction of Dolomites' glaciers (-24% of the surface during the period 1980-2000).

EVEREST, NORTH SLOPE Nivologic and glaciological research works carried out during the "K2-2004, 50 years later" expedition on the Tibetan side of the Everest

M.Pecci, G. Mortara

The article presents and discusses the results of the research activities carried out on the north Everest side during the "K2 2004 – 59 years later" expedition, specifically referring to snow science and glaciology. Special focus was placed on the meteorological-climate evolution and snow cover evolution, as well as on a hanging serac that accumulated a huge amount of ice on the route leading to the Everest Base Camp at around 6,500 m height, fortunately with no harm to people or equipment. The article then discusses the evolution of phenomena, while evaluating the general and environmental safety conditions of the Himalayan chain in the Tibetan side of the Everest during the expedition.

AVALANCHE RESCUE: EXCAVATION PROCEDURES FOR SAVING BURIED PEOPLE

A. Calderoli

There is not much information about avalanche excavation for reaching buried people, though this being a procedure that implies some complications or the risk of further damage to injured persons. It was therefore deemed appropriate to gather and organise a series of considerations aimed at carrying out excavation correctly, mainly considering that the latter should not be considered as an operation to free a buried person from the snow, but rather to reach him and create around him a space allowing for his subsequent treatment: therefore a buried person should not be freed from the snow, but rescuers should rather attempt to reach him. At the same time, an excavation procedure should favour the collection (diagnosis) of accurate information about the buried person's conditions, i.e. whether there is an air pocket along with reliable data on the efficiency of his respiratory system.

During excavation it is thus necessary to adopt some measures aimed at meeting specific requirements, following a well-defined sequence, to be summed up as follows:

1. tunnel technique
2. search and location of the air pocket
3. protection of the respiratory system
4. setting up of the first aid area.

The systematic implementation of these measures will aim at carrying out the most appropriate rescue operations, taking into account the conditions created at the moment of the avalanche stop, and mainly trying not to make them worse.

PROSPECTING SOME DOLOMITE GLACIERS USING GPR AND GPS TECHNIQUES

M. Pasta, M. Pavan, D. Sonda, F. Carollo, A. Cagnati

The article presents the results of the searches carried out on the Marmolada, Fradusta and Antelao glaciers in late summer 2004 using CPR and GPS techniques. The procedures used, which were already largely tested by the work team, allowed operators to calculate the thickness of glaciers, thus determining maximum values of about 45 metres for the Marmolada glacier, about 37 metres for the Fradusta glacier, and about 80 metres for the Antelao upper glacier.

For the GPR measurements, a 100 MHz antenna was used which provided reliable indications about medium-deep reflectors, and a 35 MHz antenna that confirmed, and in some cases dispelled any interpretation doubt for deeper reflectors.