

# ABSTRACT

## LITGHNING PHENOMENA

M. Bernardi

Lightning has always been one of the most dangerous meteorological phenomena for human activities in general, and for activities outdoor and in the mountains in particular [1]. In the light of that, this article illustrates the dangers from lightning for people operating in the mountains.

Lightning is very often considered a corollary of a storm, a more important phenomenon, and as a result studies mainly focus on the latter, which is examined by several scientific branches. Actually, lightning is a complex phenomenon and can be analysed and understood only on a scientific base. Lightning, its genesis and characteristics were first dealt with by specialists since the 18th century with the first experiments on the lightning electrical properties. Today, thanks to the modern technologies and the several achievements reached in analysing this phenomenon, it is possible to know a lot more about the fundamental characteristics of lightning and even follow in real time the presence of discharges

The article will attempt to offer a concise description of the lightning characteristics,

which readers could consider a first introduction and, maybe, an incentive to examining this phenomenon more closely.

## SNOW ON THE ITALIAN ALPS WINTER 2006-2007

M. Valt

The 2006-2007 winter season was characterised by scarce snow precipitations, mild temperatures and important wind phenomena.

The particularly mild temperatures at all altitudes conditioned the type of precipitations, with winter rains occurring even up to 3,000 m of altitude. In most of the Alps, the last meteorological winter (December-January-February) was the mildest one since 1920. And the relatively high temperatures also determined frequent phenomena of anticipated melting of snowcover, and thus in some sample areas the presence of permanent snow on ground was 30-45 days lower than the average, underlining an ongoing negative trend since the late 1980s. Lack of snow was particularly remarkable in autumn and early winter (November - 90% snowfall than average, December -25/-60%) and in April (-80%). January recorded scarce

snowfalls mainly in Western Alps, while March recorded more intense snowfalls on the whole of Southern Alps and particularly in Eastern Alps. This variation of precipitations also determined a particularly pluviometric balance (rain + melted snow) on the Western Alps and a normal or positive balance for some areas (Dolomites) of Eastern Alps.

Shortage of snowfalls, other than showing monthly characterization, also showed altimetrical characterization, with shortage rates of more than 40% up to 1,800 m of height in Western and Central Alps and of 25% beyond 2,100 m of altitude in all the sectors. The only area with a limited deficit was observed to correspond to the Dolomites, where January, March and May precipitation contributed to containing the end of season final deficit. Yet, in this area, too, like in the rest of the Alps, shortage of snow in autumn and early winter did not allow for the formation of a permanent snowcover, with negative repercussions on skiing activities in winter and on water availability in spring. Last but not least, the particular pressure configurations that have succeeded in the Alps range throughout winter resulted in strong winds, especially after snowfalls, with a general redistribution of snow and the formation of large wind eroded zones and foehn winds in the valley bottom, with resulting melting of residual snow.

## NO SIGNAL FROM WERNER M. The Frankbachtal avalanche accident

W. Beikircher

The avalanche accident occurred last 19 February 2005 in the Aurines Alps could have been an accident just like many others, which are numerically included in national and international statistics and which then inevitably lose their details in their following processing.

Thanks instead to the meticulous work of reconstruction and analysis carried out by Werner Beikircher and several favourable circumstances, it was possible to deal with and closely examine several important medical-pharmacological considerations, rescue methods, and protocols for terrestrial rescue teams and air crew. Therefore the accident takes on an important value in didactic terms and in the tragedy offers a very useful contribution to the complex world of alpine rescue, which constantly

aims at improving technical training for the many specialists who work in close synergism to help and if possible rescue people in trouble in the mountain.

The publication of this article offers to me the opportunity to say thank, probably also in the name of many readers of this magazine, to those wonderful people from the alpine rescue service I had the chance to know and appreciate during five years of activity within the CISA-IKAR avalanche commission for their steady commitment.

## THE LISA RADAR SYSTEM FOR AVALANCHES System from CCR of Ispra monitors the Olen valley at Alagna Valsesia

G. Antonello, A. Martinez-Vazquez, J. Fortuny-Guasch, M. Freppaz e M. Maggioni

The LISA (LInear SAR) system has been projected and developed at the JRC Ispra in the middle '90s. It is a Ground-Based Synthetic Aperture Radar, a kind of Radar with 2 or 3 antennas sliding along a rail, getting the same image of the target as one generated by a big Radar with an antenna long as the rail. First it was used to study building and structures deformation, but soon the main application of this technology began to be landslide monitoring. After the testing phase and the following application to monitor the Stromboli volcano after its eruption in 2003, the research had to be re-aimed to a new application, that was identified in the avalanches monitoring. A 3 years campaign at the SLF avalanche test site in the Valleé de la Sionne (Canton Valais, CH) was performed, acquiring information and data about snow surface variations. Then, since March 2006, a new smaller system (with a 2 m rail), was built for the avalanche monitoring in the Vallone dell'Olen, in the MonterosaSki resort at Alagna Valsesia (VC, Italy). After some months of test, the system was fully operative in 2006-2007 winter season, producing more than 50000 images. The main goal of the campaign is to understand if the instrument could be used in supporting the security management of a ski resort, providing real time data about avalanche events. Another important feature of the LISA system emerged with the collaboration between the JRC and the Di.Va.P.R.A. of the University of Turin: its joint use with the local



snow and meteo survey might reciprocally validate the data and improve the knowledge of avalanche process. Moreover, it could be used to update the database of the avalanche prone areas. First results are encouraging and demonstrating the validity of the methodology and of the collaboration established by the groups involved.

During the summer season 2006 a measure campaign has took place at the Bors glacier using the same LISA system. Some expected seasonal variations have been detected, showing a general retreat of the glacier. Another summer campaign is planned for the summer 2007, in order to have a longer time serie.

### **WINTER MANAGEMENT OF ROADS IN THE ALPINE ENVIRONMENT** **The experience of the Trento autonomous province**

*F. Bolego*

In the light of the climate and orographic

characteristics of the territory, the common good, the presence of numerous and important winter tourist resorts at altitudes of more than 1,000-1,200 m asl, which are the source and destination of major vehicle flows, winter maintenance of the road network within its scope is of particular importance for the autonomous province of Trento (PAT). Starting from the analysis of the chemical and physical behaviour of the thawing salt used for roads and on the basis of the experience matured by the road management service of the Trento province, the article illustrates the information criteria, the organisation and evolution of the winter road maintenance service: since the 1960s, the availability of more and more reliable weather forecast reports and the progressive diffusion of automated and electronically controlled systems have allowed for a significant reduction in the amount of chemical ice-thawing agents used, while improving the effectiveness of treatments. Last but not least, the article presents the "Coordination plan for the

management of critical situations of roads in case of intense snowfalls", as carried out by PAT in line with the information criteria and indications from the provincial warning organisation (SAP) with the aim of ensuring efficient synergism between different organisations of the Trento autonomous province, the police force and the organisation of voluntary firemen.

### **IDENTIFICATION OF POTENTIAL AVALANCHE RELEASE AREAS** **Preliminary results from the implementation of an automated GIS procedure in the Aosta Valley**

*M. Maggioni, M. Freppaz e M. Bergero*

In Alpine regions, there exist different tools to represent areas endangered by avalanches. The basic information behind these maps are data about historical avalanche events.

There are well-known avalanche paths and well-know safe zones. However, there

exist some avalanche prone areas with no record of past avalanches.

In this work, we aim to identify potential avalanche release areas (PRA) by the information about historical events, by data collected during the surveys of winter 2005-2006 and by an automatic procedure for the definition of the PRA. The automatic procedure was developed in a GIS at the SLF (Davos, CH) and is composed of simple steps that select the cells of the DEM on the basis of their topographical features, such as slope and aspect, in order to define zones characterized by avalanche prone characteristics.

In the study area, the comparison of the results of the automatic procedure, of the historical events and of the avalanches recorded during winter 2005-2006 has shown a good agreement.

In conclusions, the application of the automatic procedure results a valuable help for an expert who has to assess the avalanche danger in areas with no historical data.

Alpinismo  
Speleologia  
Escursionismo  
Trekking  
Scialpinismo

Materiali nivometeo 

Attrezzature per lavori in altezza

# **ASPORT'S MOUNTAIN EQUIPMENT**

*il tuo negozio di sport*

