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Characterization of the artificially triggered avalanches in the MonterosaSki resort (North-western Italian Alps)

Margherita Maggioni (1), A. Brulport (1), M. Freppaz (1), A. Welf (2), and R. Purves (3)

(1) Di.Va.P.R.A. - LNSA, Chimica Agraria e Pedologia, University of Torino, Italy, (2) Monterosa s.p.a., Gressoney L.T. (AO), Italy, (3) 3 Geography Department, University of Irchel, Zuerich, Switzerland

Artificially triggering methods are nowadays commonly used for avalanche prevention within ski-resorts.

The knowledge of possible relations between the characteristics of the avalanche events and the snowpack and weather conditions might help to foresee the avalanche release probability after a favorable weather cycle. The forecast might be helped by models, like for example snowpack evolution models or nearest neighbor models. The latters are based on statistics performed on large databases where the avalanche events, together with the related snow and weather conditions, are well recorded.

Within the Operational programme 'Italy - France (Alps - ALCOTRA)', Project "Gestion en sécurité des territories de montagne transfrontalière - Risk-Nat", from winter 2009-2010, in the MonterosaSki resort all the artificially triggered avalanches are registered with their characteristics (e.g. outline, type of avalanches, elevation, aspect), the triggering method (e.g. explosive, Daisy-Bell) and the snow and weather conditions.

The aim of this project is to create a well documented database in order to perform some simple statistical analysis to find possible relation between the characteristics of the avalanches (e.g. type, size, run-out distance), the topography of the site (e.g. slope angle, aspect), snowpack condition (e.g. snow crystal type, snow temperature, density) and meteorological parameters (e.g. new snow, air temperature, wind). Moreover, the avalanche release method and the result of the triggering are recorded, in order to understand which are the most favorable conditions for avalanche release.

This project is at its first operational winter, therefore in this work we present preliminary data concerning the study area, the methodology and the results from the first winter season, which might be useful to improve our knowledge about artificially triggered avalanches and to help the ski-piste security personnel to take decisions about the avalanche situation within ski-resorts.

Keywords: artificial release, snowpack characteristics, topography, prevention, forecast.