

THE AVALANCHES OF FEBRUARY 1991

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ABSTRACT

The snowcover is a memory of the time and a record of the history of the building up of the snowpack. The episodes of February 1991, from which an instable snow cover resulted, are illustrated with a daily record of nivo- meteorological parameters measured and observed at the standard test site on Weissfluhjoch at 2540 m a.s.l. During the period from the 9th to the 20th February, for two sequences, the computed avalanche probabilities and the observed avalanche events are in good agreement. These probabilities were computed with the local forecast model NXD (Buser, 1987). The total snow depth, the quantity of new snow, the penetration depth of the ram sonde, air and snow temperatures as well as the number of sunshine hours show variations which could help to explain qualitatively the instability of the snowpack. The wind speed peaked two days before the avalanche event. Taking into account these parameters and additional information, the avalanche bulletin mentioned the critical situation in this area. The 17th February, between 8h and 10h and at an elevation range from 2000m to 2300m, many locally well confined soft snow slabs occurred on slopes with an NE to E aspect. The superposition of the instable snowpack on a locally favourable topography - aspect, slope angle and roughness of the terrain - induced the avalanches which are documented with photographs. The lighting conditions did not favour the contrast. One example of a digital image processing using edge detection algorithms clearly show the size and shape of a few avalanches. These events are in good agreement with the instabilities as postulated by Salm (1986, 1992).

REFERENCES

- Buser, O., M. Bütler, and W. Good, 1987, Avalanche Forecast by the Nearest Neighbour Method, *Avalanche Formation Movement and Effects*, Proceedings of the Davos Symposium, September 1986, IAHS Publication No. 162, 557-568.
- Salm, B., 1986, Möglichkeiten und Grenzen bei der Einschätzung des Lawinenrisikos, *Oesterreichisches Kuratorium für alpine Sicherheit*, Sicherheit im Bergland, Jahrbuch 1986, 161-180.
- Salm, B., 1992, Der Anbruchmechanismus von Schneebrettlawinen und die Gefahrenbeurteilung des Einzelhanges, *Oesterreichisches Kuratorium für alpine Sicherheit*, Sicherheit im Bergland, Jahrbuch 1991, 182-194.

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