



## **On pulsed Doppler radar measurements of avalanches and their implication to avalanche dynamics**

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Pulsed Doppler radar measurements from several avalanche releases are analyzed with regard to gain in-depth understanding of avalanche dynamics. A pulsed Doppler radar emits short pulses and samples the echo in distinct time intervals, corresponding to distance intervals (range gates). Frequency analysis of the echo signals, exploiting the Doppler-effect, yields the velocity distribution within the width of a range gate. Thus, it is possible to gain information on the front speed along the track and information on the velocity versus time at a specific location in the track.

In addition to the avalanche velocity, information on the magnitude of accelerations/decelerations along the track can be derived. To this end, the velocities of a pair of adjoining range gates are compared. The accelerations/decelerations values can give implications to parameters commonly used in numeric avalanche models. The measurements indicate that these parameters are not constant and probably depend on the flow regime.

Combining these measures (and supported by additional measurements from different sensors) allows one to get a glimpse of the spatial structure of these avalanches.