

Five years use of Pulse Doppler RADAR-utechnology in debris-flows monitoring - experience at three test sites so far

Richard Koschuch (1), Michael Brauner (2), Kaiheng Hu (3), and Johannes Hübl (4)

(1) IBTP Koschuch e.U., Leutschach, Austria (office@ibtp-koschuch.com), (2) ÖBB-Infrastruktur AG, Vienna, Austria, (3) Institute of Mountain Hazards and Environment, Chinese Academy of Sciences, Chengdu, China, (4) Institute of Mountain Risk Engineering, Department of Civil Engineering and Natural Hazards, University of Natural Resources and Life Sciences (BOKU), Vienna, Austria

Automatic monitoring of alpine mass movement is a major challenge in dealing with natural hazards. The presented research project shows a new approach in measurement and alarming technology for water level changes and debris flow by using a high-frequency Pulse Doppler RADAR. The detection system was implemented on 3 places (2 in Tirol/Austria within the monitoring systems of the IAN/BOKU; 1 in Dongchuan/China within the monitoring systems of the IMHE/Chinese Academy of Science) in order to prove the applicability of the RADAR in monitoring torrential activities (e.g. debris-flows, mudflows, flash floods, etc.). The main objective is to illustrate the principles and the potential of an innovative RADAR system and its versatility as an automatic detection system for fast (> 1 km/h – 300 km/h) alpine mass movements of any kind. The high frequency RADAR device was already successfully tested for snow avalanches in Sedrun/Switzerland (Lussi et al., 2012), in Ischgl/Austria (Kogelnig et al., 2012).

The experience and the data of the five year showed the enormous potential of the presented RADAR technology in use as an independent warning and monitoring system in the field of natural hazard. We have been able to measure water level changes, surface velocities and several debris flows and can compare this data with the other installed systems.