Submitted Abstract

ID IMC22-FSAbstr- 658

First Author First Name Last Name	 Jakob (1) Schwarz
Submitting Author First Name Last Name	 Jakob Schwarz
Correspondence	jakob97schwarz@students.boku.ac.at
Co-Authors **>> E-Mails will be not listed**	Reiweger, Ingrid (1); Tollinger, Christian (2); Granig, Matthias (2)
Organisations	1: University of Natural Resources and Life Science, Vienna, Austria 2: Federal Service for Avalanche and Torrent Control, Fachbereich Schnee und Lawinen

Country	Italy
Region	Western Europe
Title	Detailed Analysis Of Friction Values For Small And Medium Avalanches In Samosat/avaframe.
Keywords	Avalanche Simulation, Samosat, Avaframe
Type	List Of Focus Session
Focus Session ID	25

Abstract

For more than two decades the avalanche simulation program SAMOS/SamosAT (Snow Avalanche Modelling and Simulation) is in use by the Austrian Torrent and Avalanche Control. The program allows the simulation of dense flow avalanches as well as powder snow avalanches. SAMOS is well calibrated for big avalanches. However, simulations of avalanches smaller than 60,000 m3 often show too large run-out distances compared to documented avalanche events. One of the main parameters significantly influencing the run-out distance is the friction parameter μ. In SAMOS and the updated versions of it (Samos2007, SamosAT and AvaFrame) the friction parameter was created by various physical approaches to form the SAMOS friction model. The problem of overly wide-spread run-out distances coupled with the application of a single friction value for all avalanches suggests the need for more precisely defined parameters. To tackle this, we collected well-documented small (< 25000 m3) and medium (25000 – 60000 m3) avalanche events with at least one known point of the maximum run-out distance. Each of these avalanche events were simulated with a range of μ values to subsequently find the simulation that is most similar to the documented avalanche in terms of the run-out distance. To find the most suitable simulation, two different evaluation methods are used: (I) an assessment by experts as a reference and (II) a user-independent method for estimating the simulation results. The maximum runout in the evaluation I and II is always placed in relation to the 1 kPa outline of the simulation. Based on the characteristics of the avalanche simulation (lengths and widths per variation of μ), a set of predefined polygons is constructed. In the case that a simulation in the run-out reaches the area of the documented event, the simulation overlaps the predefined polygons. Already changes of one grid cell (5 x 5 m) shifts the absolute quantity of cells in the respective polygon. Thus, the method using the predefined polygons (II) proves to be very sensitive to the most minor changes.

Finally, the two evaluation methods are compared and a friction value μ, depending on the size of the avalanche and on the altitude of the run-out is defined. This allows a generally more accurate simulation of dense flow avalanches in SAMOS depending on their size.

.