



Two-phase avalanche simulation in a watertank based on a turbulent dense flow

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The efficiency of a new avalanche retention construction situated in an avalanche track will be investigated with physical experiments based on the froude-model. In general numerical avalanche simulations have clear constraints due to the weak possibilities of modelling small spatial and geometrical details. Thus laboratory tests have been chosen because they seem to be the only way to test and verify the efficiency of the relatively small retention constructions. Two types of model dams scaled 1:100 were compared: a separated dam with five crossbeams versus a full dam. To generate an avalanche phenomenologically close to nature a two-phase simulation was carried out. Thus the avalanche was simulated with spherical lead particles within a tank completely filled with water. In nature retention constructions have almost no effect on pure powder snow avalanches. Thus it is necessary to simulate a fast dense flow or turbulent dense flow avalanche. The results of the physical experiments could be used to verify the efficiency of the new dam type. As a main result it turned out that the deceleration of the avalanche was higher in experiments with the separated elements than in such with the full dam. In this sense the separated dam is more efficient than a full construction type.