



Modification of powder avalanches flows due to a dam: physical simulation in a water tank for a full-scale case study

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One means of protecting mountainous areas against dense snow avalanches is to build passive defence structures in the run-out zone such as dams in order to stop the avalanche. Such a dam was designed thanks to physical and numerical approaches for a hundred-years return period avalanche in a full-scale avalanche track in the French Alps. Nevertheless such defence structures never stop the powder part of the avalanche. And a recurrent question of residents living near the avalanche track deals with the possible increase of risk for the powder part due to the presence of such catching dams. In order to quantify this residual risk, physical experiments on a small-scale model in water tank using the turbidity concept have been conducted for three different heights and two shapes of dam on a 13° slope. The use of UDV (Ultrasonic Doppler Velocimetry) method allows to measure accurately the velocity field near the obstacle. Even if such approaches are still incomplete because the similitude requirements concerning the density ratio can not be respected, it allows us to compare different configurations.