Geophysical Research Abstracts
Vol. 21, EGU2019-9797, 2019
EGU General Assembly 2019


# Research on the effects of new baffles system under rock avalanches impact

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Baffle array is generally installed in front of protection site for reducing rock avalanche's flow energy of in mountainous areas. Optimization design is vital for promoting the efficiency of hazard energy dissipation engineering. In the present study, the ace-shaped baffles were studied by being compared with traditional baffles (square baffles and cylindrical baffles) based on practical engineering. The comparison of three types of baffles was discussed in detail by experimental studies, which primarily focused on the blocking ability and effectivity. In particular, by determining the optimal case through those different types of baffles, the effects of the optimization of baffle system [column spacing, row spacing and Ld (distance between first baffle row and chute terminal)] were investigated. According to the results, the ace-shaped baffle is the optimal case among those three types of baffle, namely the deposit area and runout are all shorter than those of any other cases under the same Sr conditions. Shape changing (cylindrical to arc-shaped) will increase the fragment blockage degree; the following avalanches will go around the avalanche deposition, leading to a huge dissipation of kinetic energy. Moreover, by comparing deposition, dimensionless velocity (U*) and velocity reduction ratio (VRR), ace-shaped baffle system was shown to be very competitive in blocking ability when Sc=3.5 and Sr=4.5. The increase in the Ld can improve the energy dissipation efficiency of the arc-shaped system. Furthermore, it can also reduce the deposit area, deposit depth and deposit width effectively.