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Effects of Curvature in Avalanche Deflecting Dams

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Curved deflecting dams are an effective protection against avalanches. Three different models are applied for evaluating the effects of curvature in natural and artificial avalanche tracks. The NIS model is a continuum model for simulating dense snow avalanches, incorporating centrifugal forces in two planes, and a procedure for displacing the centre line of the flow according to these. The Schieldrop model is based on the Voellmy-Perla equations, and computes the trajectory of the centre of mass of avalanching material arbitrarily hitting a plane deflecting dam. The quasi-static approach is based on an ideal fluid in stationary flow along a curved channel. The models are applied on data from observed avalanches, to find out how curvature influences run-up, and how the models handle these effects. The NIS model provides velocities for the other two models. The models may be used to evaluate run-up on deflecting dams, providing guidelines for design.

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