



## **Retrieving avalanche basal friction law parameters from high rate positioning of avalanches**

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The Voellmy avalanche basal friction parameters are retrieved from high rate positioning of artificially released avalanches. Avalanche fronts were tracked thanks to an accurate photogrammetric system set up at the Lautaret full-scale avalanche test-site (French Alps). Couples of images were acquired at 1 frame per second with 2 APS-C DSLR synchronized cameras set at 800 meters from the avalanche track. The avalanche height and velocity are also measured at a fixed location in the avalanche track. Rheological parameters of the avalanche flow are reconstructed by an inverse optimization method using these in situ data. The direct model is a Saint-Venant type model where basal friction is parameterized according to the Voellmy's friction law. A Sensitivity analysis of the friction parameters is conducted and their uncertainty are determined. Finally the results obtained from different avalanches are compared and discussed.