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Benchmark of predictive simulations of block trajectories using field experiments

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A comparative analysis between block propagation experiments and predictive simulations of block trajectories was conducted to evaluate the predictive capacities of block propagation analyses. Approximately one hundred blocks were released on two propagation paths with topographical discontinuities and configurations promoting block rolling. The block propagation was analysed at specific locations of the paths, called evaluation screens. A significant variability of the block velocities was measured at the screens and bimodal distributions of the velocities were observed for the screens located downhill topographical discontinuities.

The comparative analysis between the experimental results and the predictive simulations shows a large variability of the simulations results, that illustrates the uncertainties related with these predictions, done without calibration data. Specific limitations of the block propagation models were shown as regards to the modelling of block propagation similar to rolling motion on soft soils. Finally, the simulations were shown more predictive for extreme velocities than for mean ones and for block passing probabilities.

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