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Characterization of debris-flow dynamics released from sudden glacial lake outburst using runout modeling.

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The rock glacier of Chauvet (South French Alps) is known to be prone to glacial outbursts. The latest event in 2008 triggered a debris-flow which reached the valley floor. The possibility of creating a debris dam in the valley floor needs to be evaluated. Given this concern, assessing the behavior of possible future events is an important issue for this catchment.
The objective of this work is to provide quantitative estimates of debris flow characteristics (runout distance, velocity, debris heights). Runout scenarios are constructed with the physically-based numerical code MassMov2D. The flow is modeled as a one phase material; its behavior is conducted by rheological laws. All the equations are solved in a 2D Euclidian space. A high resolution digital elevation model (HRDEM) derived from an aerial LiDAR survey is used. The back-calibration of the model is conducted with the help of historical information from past events and field observations, including the estimated volume of the material, the location of the source area, the spatial extent and the height of the deposits. Several scenarios are proposed by considering the possible rheological values and the mobilized volume at the source area.
The results of the analysis are presented and discussed.