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ABSTRACT BOOK

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A COMBINATION OF NUMERICAL MODELS FOR FALL AND FLOW TO SIMULATE COMPLEX LANDSLIDES

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Landslides can lead to loss of life as well as damages to public infrastructure and private property. Particularly “complex movements”, which include fall and flow processes, often occur with high velocities and energies. Therefore, they are highly dangerous. To reduce the negative consequences of such processes, it is necessary to implement adequate risk management strategies. The results of computer models are often considered in early warning systems, land use planning, and technical protection measures. Computer simulations, which are the main method of this study, are based on knowledge of the initial conditions, the physical characteristics of the movement, and information on previous events. Calculation approaches are often tailored to landslides of a specific type. Many landslides, however, display characteristics of more than one type of movement in space and time. Therefore, process chains and interactions have to be considered in mass flow simulations. But it is not always a priori clear which type of computer models better describes the process of a complex movement since there are, among others, computer models for (i) fall and (ii) flow processes. Unfortunately, very few studies have examined combinations and comparisons of different computer simulation models for “complex movements”. Therefore, the aim of this study is to combine different modelling software, to investigate if a combination can provide a better description of the process and to examine strategies of combining different numerical models. At this point, it is also necessary to develop a criteria set of key parameters which can be used to define the transition from fall to flow. The expected results should then provide a better description and understanding of the process. The chosen method is a comparative back-analysis of well-documented case studies with models designed for flows and falls (WURF, Rockyfor3D, r.avaflow). The plausibility and empirical adequacy of the model outcomes are evaluated.

Keywords: Numerical modelling; complex landslides; computer simulation; process chains; risk management strategies