



The importance of failure mechanism recognition in modelling and hazard assessment of slope instabilities

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Many classifications of slope failure mechanisms do not distinguish between failure or detachment mechanism and the possible run out (e.g. rockfall, rock slide, rock avalanche). As the failure mechanism influences the stability, the run out affects the hazard for settlements etc. initiated by a failure. An ideal model should therefore simulate both the failure mechanism and the run out. At the moment we do not have such a model and thus we have to establish a mechanically correct model for the failure mechanism and - based on its results – a model for the run out.

A catalogue of slope failure mechanisms and their mechanical models is presented. Each failure mechanism model has to take into account the geological setting and the geometry of the slope, the joint structure, the habitus of the rock blocks, as well as the mechanical behaviour of the rocks and of the rock mass (deformation and strength parameters).

The possible initial failure mechanism of a rock slope and its mechanical model must be the bases for

- Monitoring (which quantity has to be measured where?), and interpretation of monitoring results,
- Modelling and analyses (Only a mechanism embedded in a model can be the result of an analysis. There is no model at present comprising all possible mechanisms. Regarding the same geometry, the same material parameters etc. the mechanism and its mechanical model influences the result of calculations tremendously.),
- Hazard and risk assessment,

- Design of measures for decreasing instability and for warning.

Examples show the influence of failure mechanisms on the assessment of stability, of development of velocities, of amounts of detached rock influencing the hazard etc.