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Possibilities and limitations of 2D and 3D rockfall simulations – which kinds of uncertainties do we have to consider?

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In between the last years rock falls seem to occur more often in high mountainous regions. Linked with the climate change problem, this topic is mentioned in the media more and more frequently. As a consequence, especially in populated alpine regions in Europe, public authorities have to act more and more towards prevention of rock fall events. Important questions in that context are how events can be predicted more precisely in the future and how mitigation methods can be improved in endangered areas.
On that purpose, a research project has been established giving an input in different ways by means of a project site which is situated along the federal road B 305 between Unterjettenberg and Schwarzbachwacht near Berchtesgaden in the Bavarian Alps, Germany.
In that context the uncertainties concerning field work in difficult terrain are considered with regard to the subsequent simulations. It is often the case that not every part of the rock fall site can be examined in the same way. A further origin of uncertainty is the variation of the initial parameters in between a certain period of time. For example the variation of forest stands parameters because of windbreakage or avalanches. Consequently the factors of uncertainty and their possible consequences for the simulations will be analyzed.
As further aspects of the project it is intended to compare the possibilities and limitations of 2D and 3D rock fall simulations concerning the runout zones. In particular the application ranges of both methods will be analyzed using the 2 dimensional simulation codes Rockfall (Dr. Spang) and Rofmod 2D (Geotest) in comparison with the 3 dimensional simulation code Rofmod 3D (Geotest).
In this contribution the results of the field work, the analyses of the uncertainties concerning the initial parameters of rockfall simulations will be presented. (SELLMEIER & THURO 2011)

References

SELLMEIER, B. & THURO, K. (2011): Possibilities and limitations of 2D and 3D rockfall modeling – finding an optimal way for the integration of protection systems. - In: Slope stability 2011. - International Symposium on Rock Slope Stability in Open Pit Mining and Civil Engineering, Vancouver, Canada 18.- 21.09.2011; 5 p.