A study of Rockfall processes at different geomorpholocigal settings through numerical simulations in 3D

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Rockfall behaviour, at different geomorphological settings (i.e. quarry slopes, forest covered natural slopes, natural slopes including a well-established talus cone, gorge-forming slopes), have been analysed by means of real-size field experiments and numerical simulations in 3D.The numerical method used for this study, follows a process-based, hybrid-lumped mass approach, which introduces stochastic ground roughness and hyperbolic restitution factors to rockfall impacts.(Bourrier and Hungr, 2011). Rebound rotational and translational components of a projectile's velocity, are being calculated through Goldsmith's impact model (Gischig et al., 2015). The technique is scripted in Python programming language and the resulting numerical code consists Wurf, which main technical features have been first presented in GeoTirol-PANGEO (Fleris and Preh, 2016).

Different geomorphological environments involve different slope geometries, different key features of structural geology and different lithological-engineering properties. The combination of all field parameters affects rockfall behaviour from initial slope failure, to transitional motion along the slope and finally the runout.

A certain challenge during any numerical rockfall simulation, would be the correct selection of input parameters. Therefore, the purpose of this work is to document a methodology for deriving reliable parameters for Wurf on the basis of back-analyzed field experiments and well documented rockfall events, as well as to investigate parameter space and its relation to distinct geomorphological environments.