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CONEFALL: a program for the quick preliminary estimation of the rock-fall potential of propagation zones

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Abstract:
Rock-fall propagation areas can be roughly assessed using a simple geometric rule based on a physical model. The propagation zones are estimated using a digital elevation model (DTM) grid file and a grid file containing the source areas. Each potential unstable rock slope grid point is considered a potential rock-fall source. The points of the DTM that are lowest in altitude, and located within a cone centered on a source point, define the potential propagation area associated with that grid point geometrically. Previous studies indicate the slope angle of the cone ranges from 27° to 37°. CONEFALL is a program simulating this principle. This model is utilized to discuss different solutions using previous works and an example of an actual rock-fall event. The physical model permits the estimation of velocities and energies within rock-fall potential areas.