Rockfall modelling: interaction of a boulder with a talus slope

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Rockfalls stand for a major risk in mountainous zones since they entail serious damages on residential areas and infrastructures. The kinematic analysis of rockfalls is a powerful method to predict the risk encountered.

An accurate modelling of the impact phase is essential to a proper rockfall model. So, the aim of this study is to develop a relationship between the incident and reflecting kinematics properties of a boulder impacting a rocky ground.

The soil will be modelled as a non cohesive granular medium using the discrete element method. We will particularly take care to the accuracy of ground characteristics description (grain size distribution, particle size and shape, contact between particles. . .)

The simulation of the impact between spherical or rectangular boulders and this substrate will first improve the understanding of this phenomenon. Then, based on previous studies emphasizing the stochastic nature of the reflecting law for a normal impact, a numerical simulation campaign will be driven to establish a stochastic reflecting law.

An investigation may also be held to develop the integration of this law into existing rockfall models.