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## APPLICATION OF EMPIRIC MODELS FOR THE ANALYSIS OF ROCK-FALL RUNOUT AT A REGIONAL SCALE IN MOUNTAIN AREAS: EXAMPLES FROM THE DOLOMITES AND THE NORTHERN APENNINES (ITALY)

**ABSTRACT:** PIACENTINI D. & SOLDATI M., *Application of empiric models for the analysis of rock-fall runout at a regional scale in mountain areas: examples from the Dolomites and the northern Apennines (Italy)*. (IT ISSN 0391-9838, 2008).

Rock falls are common in mountain areas and represent a serious threat due to their high propagation velocity that, independently from the volume involved, can be extremely dangerous for buildings, roads and persons. Therefore, it is necessary to preliminarily identify the areas most prone to this type of process, in order to pursue a territorial planning with consciousness of hazards and risks. Rock-fall hazard analysis over wide territories is anyhow rather difficult, because many variables have to be taken into account (i.e., fracturing of rock masses, presence of water etc.) that are difficult to identify at that scale. Hence the necessity to identify methodologies of analysis capable of reproducing the complex processes that are involved in rock-fall occurrence and propagation and to preliminarily identify the areas most susceptible to this type of hazard.

Taking into account previous works carried out on this topic, different simulation models, both empirical and kinematic, have been analysed in order to assess their suitability (in terms of quality, time and costs) when applied over wide territories. The most suitable model was found to be an empirical one that assumes the dissipation of rock-fall energy proportional to the distance reached by the falling rock mass. This model has been used, after a specific calibration, with reference to two different study areas characterised by different geological and morpho-climatic characteristics, in order to assess its applicability and validate the quality of the results. The study areas are located in the Dolomites and in the northern Apennines (Italy).

The comparison of the results obtained with respect to the two study sites has shown that the empirical model selected can be an efficient analysis method to obtain reliable results over wide territories, independently

from the geological and morpho-climatic characteristics of a certain study site.

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