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Investigation of rainfall-induced failure processes and characteristics of wedge slopes using physical models

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In this study, the small-scale physical modeling tests have considered the impact of the infiltration of rainfall in order to investigate the processes involved in wedge slope deformation and failure. We are conducted under controlled conditions of the intersection angle and half wedge angle. Observations obtained during each stage of deformation and failure were used to explain how gravity deformation varies on wedge slopes, and infer how rainfall influence slope failure. The results indicate that half wedge angle is a crucial factor in the deformation failure of slopes. The failure mechanisms of low intersection angle slopes (sliding model) differ considerably from those of high intersection angle slopes (free falling or toppling model). The infiltration of surface water can have a significant influence on rock layer deformation and the speed of failure. Details of the failure characteristics of wedge slope models are discussed in this paper.

Keywords: physical modeling, rainfall, wedge slope, the intersection angle, half wedge angle.

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