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Mobilization Process of Landslide-Induced Debris Flows

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Landslide-induced debris flows are among the most damaging geological hazards associated with earthquakes or rainfalls. During its sliding process, the landslide may gradually transfer to the debris flow under favorable conditions, such as liquefaction due to increasing granular temperature in fluidized layer; the contraction induced excess pore pressure and the collision among grains. The thickness of fluidization and the mobilization process of the granular body are examined by the conveying belt and slope flume experiments. The parameters of landslide-induced debris flows are examined by experimental work and theoretical analysis. The parameters include the coefficient of friction, channel slope, granular temperature and the thickness of the landslide. The coefficient of friction between the lower fluidized layer and the upper solid mass depends on collision condition at the interface. In this study, a theoretical model is also proposed to examine the run-out distance and the corresponding fluidized thickness of the sliding mass.