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滑坡侵蚀离散元分析研究

郑书彦1，2，李占斌1，李甲平3，苟建忠4

(1. 西安理工大学 水利水电学院，陕西 西安 710048；2. 长安大学，陕西 西安 710054；
3. 甘肃省宁县气象局，甘肃 宁县 745200；4. 甘肃省地勘局，甘肃 天水 725400)

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摘要 首先介绍了离散单元法分析原理，用铜王公路2#滑坡侵蚀实例建立了地质模型，根据黄土中实际最为发育的垂直节理面以及层面来划分单元及建立计算模型，滑坡体被这2组结构面分割成297个单元，滑体以下的滑床基岩部分作为固定单元处理。采用离散单元法对滑坡侵蚀运动过程中各演化阶段的平均速度、平均加速度，滑坡侵蚀体后缘、中部、前缘的合力、合力矩进行了分析研究，由此可将滑坡的演化过程划分为5个运动阶段：启动破坏、剧动加速、高速运动、碰撞减速、停滞缓动。

关键词 岩土力学；滑坡侵蚀；离散元；演化过程

分类号

STUDY ON LANDSLIDE EROSION BY DISCRETE ELEMENT METHOD

ZHENG Shu-yan1，2，LI Zhan-bin1，LI Jia-ping3，GOU Jian-zhong4

(1. College of Water Resources and Hydroelectric Engineering，Xi¢an University of Technology，Xi¢an 710048，China；2. Chang¢an University，Xi¢an 710054，China；3. Ningxian Weather Bureau of Gansu，Ningxian 745200，China；
4. Geology Exploration Bureau of Gansu，Tianshui 725400，China)

Abstract

The principle of discrete element analysis method is introduced and applied to simulate a real case of the No.2 landslide on Tong—Wang highway. The geological model is built up with consideration of vertical joints and strata planes as discrete discontinuities in loess. Then the landslide body is meshed into 297 units by the two sets of structural planes，while the units under the sliding bed which is bed rock are treated as fixed. Furthermore，discrete element method is used to analyze the typical characters of the erosion evolution process of landslide. The average velocity，average acceleration，resultant forces and moment in back，middle and front portion of the landslide are calculated. The results suggest that the evolution process of landslide can be divided into five stages，i. e. initial breaking stage，extensive accelerating stage，high speed moving stage，bumping deceleration stage and slow braking stage.

Key words rock and soil mechanics；landslide erosion；discrete element；evolution process

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通讯作者