

The Deformation Prediction Model on Rainfall-triggered Shallow Landslide

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Abstract: Landslide is a geological phenomenon, which stimulated by certain predisposing factors, losing stability and sliding. It is the main type of geological disasters. Especially the largest number of rainfall-landslide, shallow landslide is the most widely distributed. we analysis the deformation of Rainfall-triggered Shallow Landslide in this article. we establish one-dimensional equation of motion of the landslide based on the functional principle, combining with the Terzaghi consolidation principle, and study the dissipation of pore water pressure in the course of the campaign, revealing the dynamic evolution process from the movement to stop. Finally, we build a rainfall-triggered shallow landslide deformation prediction model. Taking the displacement of Dujiangyan taziping landslide for example, We deduce the rate of landslide movement, displacement and rainfall quantitative relationship by the use of mathematic.

Key words: Rainfall; shallow landslides; deformation prediction; model analysis

封面照片说明: 贡嘎山海螺沟冰川

贡嘎山是青藏高原东部大雪山脉的主峰,也是青藏高原东部的最高峰,海拔 7 756 m,位于四川省康定县和泸定县之间。由于其海拔高,降水充沛,海洋性冰川发育。以贡嘎山为中心,发育有 74 条现代冰川,冰川面积达 255.1 km²,其中海螺沟冰川最为著名。

海螺沟发育于贡嘎山东坡,沟口高程不足 1 400 m,距主峰水平距离约 25 km,垂直落差超过 6 300 m。巨大的地形高差使海螺沟流域内垂直地带性显著,从亚热带至寒带的自然带谱完整,具有冰川奇特、森林茂密、环境优美的独特景观。其上游发育的海螺沟冰川为贡嘎山最长的一条现代冰川,长度超过 13 km,冰川末端高度仅 2 980 m,各种冰川和冰缘地貌,如冰下河、冰川城门洞、冰裂隙、冰阶梯、石蘑菇、冰川漂砾、冰川瀑布、冰川侧碛和终碛、冰川擦痕、“U”形谷及现代冰川退缩遗迹等十分发育。

照片为海螺沟冰川近末端段。

(嘉 益)