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基岩断层错动对心墙堆石坝的影响研究

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摘要 用三维有限元法模拟木格措水电站心墙堆石坝坝址处基岩中的断层错动, 分析断层错动对坝体尤其是坝体的防渗系统(包括土质心墙和混凝土防渗墙)的影响。计算模拟中, 假定断层错动50 cm, 错动方向可以是竖直方向, 也可以是水平方向。同时, 将断层错动情况下的坝体应力变形性状与断层没有错动的情况进行对比分析。计算结果表明: 坝基70 m厚的覆盖层有明显的缓冲作用, 可减轻断层错动变形向坝体的传递。断层错动后, 土质心墙的应力水平略有提高, 但大多提高0.4~0.6 MPa。断层错动50 cm对坝体包括坝壳和土质心墙本身不构成威胁, 但将导致断层附近的混凝土防渗墙局部破坏。因此, 防渗系统是否失效还需进行相关的渗流及渗透变形研究。

关键词 [水利工程](#) [心墙](#) [堆石坝](#) [错动](#) [断层](#) [有限元法](#)

分类号

STUDY ON INFLUENCE OF FAULT DISLOCATION ON A CORE ROCKFILL DAM

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Abstract

Three-dimensional finite element method is used to simulate the dislocation of a fault beneath the core wall of a rockfill dam; and the influence of the dislocation upon the core rockfill dam, especially upon the seepage prevention system (including clay core wall and concrete cut-off wall) is investigated. It is supposed that the maximum dislocation is 50 cm, and the dislocation direction is vertical or horizontal. Furthermore, the stress-deformation behavior of dam with fault dislocation is compared with that of the dam without fault dislocation. The simulated results indicate that the overburden consisted of granular soils which is about 70 m in thickness plays an important role in reducing the dislocation to transfer to the dam including the core. In the case that fault dislocation is 50 cm, the stress level of the clay core increases with a magnitude of 0.4~0.6 MPa, and there is no abrupt deformation in the core. If the dislocation is limited with 50 cm, it will not induce the failure of the dam itself, but will result in the local damage of the concrete cut-off wall nearby the fault. Further study on seepage is necessary due to the damage of the concrete cut-off wall.

Key words [hydraulic engineering](#) [core wall](#) [rockfill dam](#) [dislocation](#) [fault](#) [finite element method](#)

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