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考虑调洪的一维漫顶不溃与漫顶溃坝过程模拟(PDF)

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Title: One-dimensional simulation of only overtopping and overtopping breaking process

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关键词: [一维数值模型](#); [漫顶](#); [溃坝过程](#); [调洪](#)

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摘要: 建立了一维数值模型,可模拟包括瞬时溃与逐渐溃的漫顶溃坝过程,同时可模拟对于混凝土坝失事来说最常见的漫顶不溃过程;可考虑泄水建筑物的调洪过程对溃坝过程的影响,且针对泄水建筑物不同的布置形式,能够分别模拟位于坝身与岸边的泄水建筑物。以土心墙堆石坝为例,模拟大坝的漫顶逐渐溃过程,分析了溃口流量、泄水建筑物流量的变化过程,可知溃坝发生后,溃口流量急剧增大,泄水建筑物泄量迅速降低;对比分析了不同漫顶原因、溃决形式以及溃决历时下的流量过程。以混凝土重力坝为例,模拟大坝的漫顶不溃与漫顶瞬时溃过程,分析了不同溃决形式下大坝下泄总流量的变化过程,可知溃坝发生后,大坝下泄总流量突增后降低,不同工况下,随着溃口尺寸越大,总流量峰值越大,流量下降的速度越快,稳定时间越短。

Abstract: This paper builds a 1D numerical model that can simulate instant and gradual dam break process due to overtopping as well as the only overtopping process, which is the most common process of concrete dam failure. The model can consider the influence of flood regulation process of water release structure on dam break process, and simulate the water release structure in dam or on both sides of dam for different layout forms of water release structures. The paper took a soil core wall rockfill dam as an example, simulated the gradual dam break process due to overtopping, analyzed the discharge curves of breach and water release structures. It is shown that after the break, the discharge of breach increases rapidly and water release in structures reduces rapidly. Then different reasons of overtopping, forms of breach and duration of break was analyzed and

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compared. With an example of a concrete gravity dam, only overtopping process and instant dam break process due to overtopping were simulated, the dam' s total released discharge with different forms of breaches were analyzed. The result indicated that, after the dam break, the dam' s total released discharge reduces after instant abrupt increase, and in all analysis cases, the larger the breach' s size, the greater and faster the total released discharges, the faster the discharge speed declines, and the shorter the stable time.

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