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单切口坝对稀性泥石流的拦砂性能——试验

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Title: Sediment-intercepting effect of slit dam on non-viscous debris flow:experimental study and comparative analysis

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关键词: [单切口坝](#); [稀性泥石流](#); [拦砂效应](#)

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摘要: 通过室内水槽试验,探讨了单切口坝对稀性泥石流的拦砂性能,并与梳子坝的试验结果进行了比较分析.初步得到:(1)单切口坝有全闭塞、部分闭塞和不闭塞3种闭塞类型.当切口宽度 b 与稀性泥石流中最大颗粒粒径 d_{\max} 之比 $b/d_{\max} \leq 0.394$ 时,切口全闭塞; $b/d_{\max} \geq 1.478$ 时,切口不闭塞; $0.394 < b/d_{\max} < 1.478$ 时,切口为部分闭塞.(2)单切口坝在降低过坝泥石流密度变化量上,与梳子坝有相似规律.对单切口坝而言, b/d_{\max} 在0.394~0.739之间,过坝泥石流密度变化量随 b/d_{\max} 增大而增大,在 $b/d_{\max} = 0.739$ 时,过坝泥石流密度变化量达到最大,其后随着 b/d_{\max} 的进一步增大,过坝泥石流密度变化量逐渐减小;在 $0.493 \leq b/d_{\max} \leq 0.986$ 之间,单切口坝降低过坝泥石流密度变化量较显著.(3)在相同的试验条件下,以过坝泥石流平均密度及其降低率为防治泥石流的效益指标,显示梳子坝与单切口坝的坝后平均密度的比值大多小于1,表明在相同的试验条件下梳子坝对稀性泥石流的防治效果较好.

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Abstract: Through a series of flume experiment indoors, the sediment-intercepting effect of slit dam on non-viscous debris flow was explored and a comparative analysis with comb dam was conducted. The result shows that (1) there are three kinds of blocking condition, i. e. whole blocking, partial blocking and no blocking, and the occurring kind of blocking condition depends on the ratio b/d_{\max} between slit width and diameter of the maximum grain; (2) in respect to decreasing density of dam-passing debris flow, the same law exists for slit dam and comb dam, and the density decrease varies with b/d_{\max} ; (3) in same experiment condition, the non-viscous debris flow-preventing/controlling effect of the comb dam is better than that of slit dam.

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