An investigation of joints behavior in seismic response of arch dams

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ABSTRACT

There has been extensive research to examine the effects of contraction joints opening in the nonlinear seismic response of arch dams. However, there has been less attention on the effects of perimetral joint on the response. In this study, a special finite element program is developed, that is described and verified initially. Based on this program, the nonlinear dynamic behavior of a typical thin arch dam is studied. The perimetral joint, as well as, contraction joints are included in the nonlinear cases analyzed. It is shown that the distributions of the maximum tensile stresses are very sensitive to the properties used for the joints. Moreover, the modified joint model proposed for the modeling of perimetral joint is found to be less sensitive and very effective in seismic analysis of concrete arch dams.

KEYWORDS