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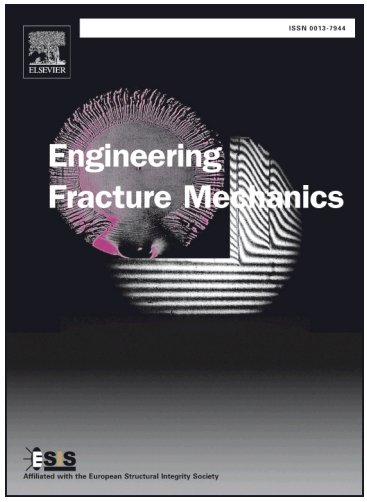

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A large time increment method applied to an interface cohesive crack growing in compression-shear conditions

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Abstract

When the long-time behaviour of a concrete dam is analysed, the International Commission of Large Dams recommends to neglect the tensile strength of the dam-foundation joint and to include the uplift pressure due to the water penetrating into the crack. In this context a non-linear problem of contact with friction occurs in the vicinity of the point which separates the damaged part of the joint from the undamaged one. In these conditions the solution depends on the stress path followed during the quasi-static incremental process. Therefore the classical Newton-Raphson fails to converge and has to be replaced by a Large Time Increment method. In this way it was possible to obtain realistic solutions for three different mechanical regimes.

Keywords:
Cohesive crack model, concrete, hydro-mechanical coupling, interface crack, gravity dam

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