

## Alkali-Silica Reaction in concrete – numerical modelling: an engineering approach

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### ABSTRACT

Paper presents chemomechanical model of alkali-silica reaction (ASR) for concrete. Two models of first order kinetics are presented in depth and authors' own modifications of them pertinent to dependence on variable temperature and humidity are discussed. Then, for the known reaction extent (scalar variable) a numerical algorithm developed by authors in order to solve chemomechanical problems is presented. The main advantage of the proposed algorithm lies in that there is no need to build special FEM code in order to solve the problem – instead commercially available codes can be used. Performed exemplary numerical computations for a gravity dam show that the proposed approach renders quite well actual behaviour of an ASR affected structure.

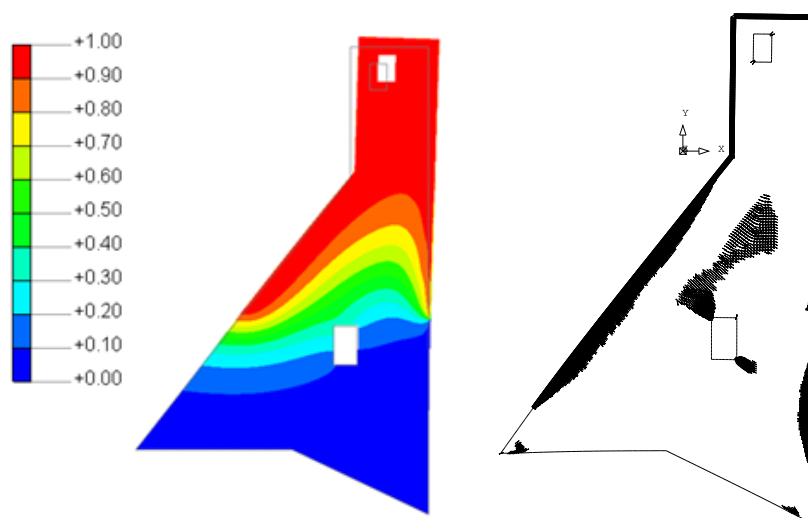


Fig. 1 ASR extent, crack pattern (Fontana Dam)

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