

## **Calibration of hydraulic and tracer tests in fractured media represented by a DFN model**

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**Abstract** A methodology is proposed for interpreting hydraulic and tracer tests in a discrete fracture network (DFN). To start off, an externally generated network of fractures (represented by 2-D disks) is embedded in a 3-D domain. Since each generated DFN is considered as one of the possible outcomes, a stochastic approach is adopted. In each DFN, the connections between the disks define a conductive network, modelled as a suite of 1-D elements. The hydraulic conductivity and specific storage coefficient for each element form the product resulting from an individual value multiplied by a parameter; this is the same for all the elements and corresponds to a disk belonging to a given family. These family parameters are fitted by means of an inverse problem solution using available pumping test data. Tracer tests are also used to inversely calibrate solute transport parameters (mobile and immobile porosities, dispersivity, and diffusion in the fractures and matrix). The methodology is illustrated with hydraulic and tracer tests performed at the El Berrocal site (Spain).

**Keywords** discrete fracture network; fractured media; hydraulic and tracer test interpretation