



## Can equivalent continuum models simulate flow and pollutant transport in fractured limestone aquifers?

Costantino Masciopinto (1) and Domenico Palmiotta (2)

(1) IRSA, CNR, Bari, Italy (costantino.masciopinto@ba.irsa.cnr.it), (2) Politecnico di Bari, Bari, Italy (domenico.palmiotta@ba.irsa.cnr.it)

The use of equivalent continuum models might help hydrogeologists to solve flow and pollutant transport problems in fractured aquifers, where orientations, lengths, apertures and number of fissures are difficult to quantify.

Successful simulations of flow and transport in fractured limestone are achieved by accommodating a tortuosity/conductivity relationship in the standard fracture flow equation. The importance of tortuosity correction is on the possibility of switching from a continuum model to an apparent discrete tube model, by taking into account of effective water velocity along flow-paths in a fracture.

MODFLOW/MT3DMS equivalent continuum models have been applied to a fractured limestone aquifer in Bari (southern Italy). The simulation results have been compared with solutions obtained using also a specific software, which solves the same flow and transport problems in a 3D set of parallel fissures. Results of a pumping tracer test were used to compare main features of the applied models.