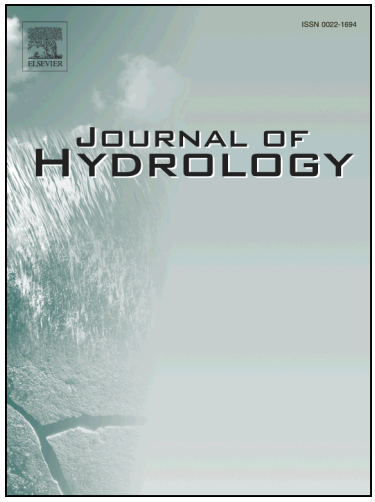

Research papers

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PII: S0022-1694(17)30652-2
DOI: https://doi.org/10.1016/j.jhydrol.2017.09.048
Reference: HYDROL 22268

To appear in: *Journal of Hydrology*

Received Date: 30 July 2017
Accepted Date: 26 September 2017

Please cite this article as: Peng, S., Zhang, Z., Li, C., He, G., Miao, G., Simulation of water flow in fractured porous medium by using discretized virtual internal bond, *Journal of Hydrology* (2017), doi: https://doi.org/10.1016/j.jhydrol.2017.09.048

Simulation of water flow in fractured porous medium by using discretized virtual internal bond

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Abstract:

The discretized virtual internal bond(DVIB) is adopted to simulate the water flow in fractured porous medium. The intact porous medium is permeable because it contains numerous micro cracks and pores. These micro discontinuities construct a fluid channel network. The representative volume of this fluid channel network is modeled as a lattice bond cell with finite number of bonds in statistical sense. Each bond serves as a fluid channel. In fractured porous medium, many bond cells are cut by macro fractures. The conductivity of the fracture facet in a bond cell is taken over by the bonds parallel to the flow direction. The equivalent permeability and volumetric storage coefficient of a micro bond are calibrated based on the ideal bond cell conception, which makes it unnecessary to consider the detailed geometry of a specific element. Such parameter calibration method is flexible and applicable to any type of element. The accuracy check results suggest this method has a satisfying accuracy in both the steady and transient flow simulation. To simulate the massive fractures in rockmass, the bond cells intersected by fracture

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