On the Effect of the Small Scale Variability of the Hydraulic Conductivity on Groundwater Flow and Transport Modelling.

Details

Meeting	2006 Joint Assembly
Section	Hydrology
Session	Recent Advances in Groundwater Hydrology Posters
Identifier	H23E-03

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Index Terms

Groundwater hydraulics [1828]
Groundwater hydrology [1829]
Groundwater quality [1831]
Instruments and techniques: modeling [1894]
Instruments and techniques: monitoring [1895]

Abstract

The advection-dispersion equation presents several anomalies, such as the tailing in the breakthrough curves, which can be determining in engineering design. Some authors purportedly add exchange terms to the classical equation, aimed at reproducing the late time behaviour. A recent approach is the continuous time random walk, which allows for a systematic study of the transition from Fickian to non-Fickian transport. However, we argue that the tailing in the breakthrough curves can be attributed to the structure of the underlying flow field (particularly, to the small scale variability of the hydraulic conductivity / transmissivity field). In this work, we explore the effect of this variability on the groundwater flow and transport modelling and present a methodology capable of reproducing the tailing effect using the classical advection-dispersion equation.