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## The physical meaning of transport properties evaluated from BTC in karst conduit networks using transfer functions

**Chaoqi Wang**, Xiaoguang Wang, Vianney Sivelles, Samer Majdalani, Vincent Guinot, and Hervé Jourde

Laboratoire HydroSciences Montpellier, CNRS-UM-IRD, Montpellier, France ([chaoqi.wang@etu.umontpellier.fr](mailto:chaoqi.wang@etu.umontpellier.fr))

The Transfer Function (TF) approach, applying the Laplace transform, is known to be effective in interpreting tracer BreakThrough Curves (BTCs) in karst systems. Although this approach has several advantages over the classical Advection Dispersion Equation (ADE), the parameters of the TF are difficult to interpret directly in terms of transport properties, e.g., flow velocity and dispersion coefficient.

We present two approaches to relate the TF parameters to those of the ADE parameters. The first uses a consistency analysis, the other uses an asymptotic analysis in the Laplace space. The TF parameters can be transformed into equivalent ADE parameter groups that have an apparent physical meaning about the transport process. We further provide guidelines for choosing the suitable fitting models for artificial tracer tests and offer some suggestions for utilizing the TF approach in BTCs interpretation.