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# Parameter identification of solute transport with spatial fractional advection-dispersion equation via Tikhonov regularization

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## Abstract

This paper employs Tikhonov regularization method to estimate the parameters of solute transport in soil with spatial fractional derivative advection-dispersion equation. The estimated parameters include the fractional derivative order, the dispersion coefficient and the average pore-water velocity. Several examples are included to test the presented method, and the method presented is efficient, feasible and easy to develop for the problem whose analytical solutions are difficult to be obtained.

**Keywords:** Parameter identification; Fractional derivative advection-dispersion equation; Tikhonov regularization

## 1 Introduction

Many studies have indicated that the solute transport processes can be described by the conventional advection-dispersion equation (ADE) model based on Fick's law, especially to simulate the contaminant transport in homogenous media. However,

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