



## **Analytical solution for solute transport in a finite domain with kinetic sorption**

You-Lin Tu (1), Keng-Hsin Lai (1), Jui-Sheng Chen (1), and Ching-Ping Liang (2)

(1) Applied geology, Nation Central University, Taoyuan City, Taiwan, (2) Department of Nursing, Fooyin University, Kaohsiung City, Taiwan

This study presents an analytical solution for solute transport in a finite domain with kinetic sorption. The governing equation includes terms accounting for advection, dispersion, non-equilibrium kinetic sorption, and first order decay processes. The analytical solution is derived by using the Laplace transform with respect to the time variable and the generalized integral transform technique with respect to the spatial variable. The derived solution is tested against a numerical solution using the Laplace finite difference method. The results shows excellent agreements between the analytical solution and numerical solution. Moreover, the derived solution is compared with the solution for equilibrium sorption to illustrate the effect of kinetic sorption on solute transport.