

# **Numerical Reconstruction and Remediation of Soil Acidity on a One Dimensional Flow Domain Where the Diffusion Coefficient and Advection Velocity are Exponentially Dependent on Time**

Catherine Mutheu Munene<sup>1</sup>, **Thomas Tonny Mboya Onyango**<sup>2\*</sup> and Cleophas Muhavini<sup>1</sup>

<sup>1</sup>Catholic University of Eastern Africa,

<sup>2</sup> \***Department of Industrial and Engineering Mathematics Technical University of Kenya.**

## **Abstract**

A one dimensional mass transport equation in porous medium whose solution is ill-posed is considered. Appropriate flow parameters that are consistent to flow of solutes are determined. Solute diffusion coefficient and advection velocity are taken to be exponentially changing with time. Flow domain is assumed semi infinitely deep and homogeneous. Finite volume and finite difference methods are used for spatial and temporal discretization of the governing PDE. Solutions for possible combinations of time dependent flow parameters at different soil depths and time intervals are compared with help of graphs. It is observed that the concentration levels of ions with depth and time can be detected early when the two parameters are negative exponential functions of time before further pollution takes place in the underground environment. Keywords: Inverse problems, Finite Volume Method, Advection, Diffusion, Reconstruction, Remediation

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