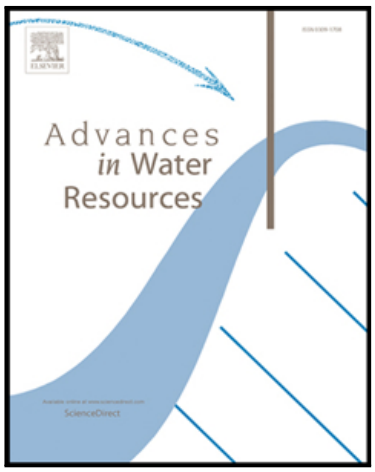

Impact of small-scale saline tracer heterogeneity on electrical resistivity monitoring in fully and partially saturated porous media: insights from geoelectrical milli-fluidic experiments

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Impact of small-scale saline tracer heterogeneity on electrical resistivity monitoring in fully and partially saturated porous media: insights from geoelectrical milli-fluidic experiments

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Abstract

Time-lapse electrical resistivity tomography (ERT) is a geophysical method widely used to remotely monitor the migration of electrically-conductive tracers and contaminant plumes in the subsurface. Interpretations of time-lapse ERT inversion results are generally based on the assumption of a homogeneous solute concentration below the resolution limits of the tomogram depicting inferred electrical conductivity variations. We suggest that ignoring small-scale solute concentration variability (i.e., at the sub-resolution scale) is a major reason for the often-observed apparent loss of solute mass in ERT tracer studies. To demonstrate this, we developed a geoelectrical milli-fluidic setup where the bulk

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