Contribution ID: **780** Type: **Poster (+) Presentation**

Solute Transport in Heterogeneous Soils from Different Land Management Practices

Tuesday, 1 June 2021 10:00 (1 hour)

The fate and transport of agrochemicals in soils have important implications for groundwater quality and public health. Land management practices deliberately change the pore structure, which consequently controls how mass is transported through the subsurface of agricultural lands. This study employs direct numerical simulations (DNS) to investigate the differences in transport behavior in porous media sampled from a long-term agricultural research station. Millimeter-size samples of soils characterized as ploughed and no tillage are analyzed. The velocity field in each soil domain is solved from the full Navier-Stokes equations and massless particle tracers are tracked accordingly. A statistical analysis of the Lagrangian tracks is presented to compare the velocity variability, breakthrough curve and evolution of displacement moments that characterize each land management practice. Statistical rules for particle motion at the pore-scale are then applied to parameterize an upscaled transport model based on Continuous Time Random Walk theory. Such a modeling framework shows promise in capturing the non-Fickian behavior that is ubiquitous in all heterogeneous media. An improved understanding of the controls for contaminant transport in agricultural soils and of the predictive tools to model contaminant transport are key to helping decision makers implement sustainable strategies in agriculture.

Time Block Preference

Time Block C (18:00-21:00 CET)

References

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