Contribution ID: **524** Type: **Oral Presentation**

Lagrangian modeling and upscaling of pore-scale transport in random media

Tuesday, 31 May 2022 10:45 (15 minutes)

We consider simulation and upscaling of advective-diffusive transport processes based on a Lagrangian modelling approach. Our study leverages simulated Lagrangian particle trajectories in periodic three-dimensional pore-spaces. These trajectories are then exploited through an upscaling method that relies on a spatial Markov model, ultimately yielding prediction of the particle travel times and locations at large distances and times. The key feature of the approach is that it can retain subscale features, as these are tied to the recorded trajectory paths. We demonstrate the application of this approach to modelling of transport in media characterized by a single or dual diffusivity. In the former case, transport is assumed possible only in the pore space via advection and diffusion, while in the latter we assume that transport may take place also in the solid grains via pure diffusion. The dual diffusivity case thus requires to deal with a spatially discontinuous diffusion coefficient, i.e. assumes different diffusion coefficients between liquid and solid phases. Our approach allows characterizing these transport scenarios with high computational efficiency. We discuss the validation of the method and the capabilities of the approach towards characterization of coupled processes. The results enable us to assess the impact of the sample porosity on the physical characterization of transport and on the performance of the method.

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Time Block Preference

Time Block A (09:00-12:00 CET)

Participation

Online

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