

Abstract Submitted
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Modelling large-particle diffusion in porous media as anisotropic continuous-time random walk SHAHAR AMITAI, RAPHAEL BLUMENFELD, Imperial College London — We test the fidelity of modelling diffusion of finite-size particles in porous media by continuous-time random walk (CTRW), where the step-size and waiting-time distributions of the former, P_l and P_t , are used as input to the latter. As the particle size is increased, the diffusion undergoes a transition from normal to anomalous. We find that, based only on P_l and P_t , CTRW does not predict correctly this transition. We show that the discrepancy is due to the change in effective connectivity (topology) of the porous media with increasing particle size. We propose a method to capture this within the CTRW model by adding anisotropy. This adjustment yields good agreement with the simulated diffusion process, making it possible to use CTRW, with all its advantages, to model diffusion of any finite size particle in confined geometries.

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