

Abstract Submitted
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Polymer Transport Near Rough Surfaces MOSES BLOOM, Northwestern University, JONATHAN WHITMER, University of Illinois, ERIK LUIJTEN, Northwestern University — The rheology of dilute polymer solutions under confinement is important in biology, medicine, microfluidic device design, synthetic polymer processing, and even geologic porous media. However, the solution's specific interactions with the confining surface are poorly understood. This situation is exacerbated for composite nanoparticles, such as polymer/metallic hybrids. Using multi-particle collision dynamics, we find a rich array of transport regimes depending on small-scale surface roughness and the specific surface/solute interactions. These factors couple to hydrodynamic conditions, including flow strength and confinement geometry in unexpected ways. Our findings may be relevant to transport phenomena in certain rough-walled capillaries, such as the distribution of various nanoconjugates in vivo.

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