

# **STUDYING MESOSCALE FLOW PHENOMENA WITH DISSIPATIVE PARTICLE DYNAMICS**

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Dissipative Particle Dynamics (DPD) is a relatively new method for studying soft materials and complex fluids at a coarse-grained level. In the talk, we present some ideas on DPD-based methods to simulate flow on mesoscales, focussing on applications to electrolytes and electrokinetic phenomena.

After a brief introduction, we will first introduce a model for a colloid with variable surface slip and discuss recent results on the dielectric response of colloids in electrolyte solution to an external alternating field. Then we present a new hybrid DPD-Brownian Dynamics method which was specifically designed to enable efficient DPD-based simulations of electrolytes at high salt concentrations. The method is applied to the simulation of electroosmotic flow on superhydrophobic surfaces, and the results are compared to recent theoretical predictions by A. Belyaev and O. Vinogradova.