

GRK 2516 Soft Matter Seminar

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None

Research seminar of the DFG Research Training Group GRK 2516 (<https://grk2516.uni-mainz.de>).

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Colloidal suspension dynamics using multi-particle collision dynamics with a discrete particle model

Understanding the dynamics of colloidal suspensions is essential for prediction and engineering of micro-structures that have several technical applications. Owing to the complexity of particle interactions, numerical techniques are well suited for studying such systems.

We are interested in studying colloid dynamics using mesoscale computer simulations, focusing on a recently proposed approach based on multi-particle collision dynamics. A major benefit of this approach is that it allows us to simulate colloidal particles with complex geometries. We have studied the equilibrium and sedimentation dynamics of spherical particles in suspensions with varying concentrations. Compared with other theoretical and experimental studies, we found some anomalies with the short-time equilibrium dynamics, but the long-time equilibrium dynamics and sedimentation dynamics are consistent with the presence of appropriate hydrodynamic interactions. To demonstrate the extensibility of the approach, we study the equilibrium dynamics of cubic colloidal particles.