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Short-time dynamics in dispersions with competing short-range attraction and long-range repulsion RIEST JONAS, GERHARD NAEGELE, Institute of Complex Systems (ICS-3), Forschungszentrum Juelich GmbH, 52425 Juelich, Germany — The dynamic clustering of globular particles in suspensions exhibiting competing short-range attraction and long-range repulsion such as in protein solutions has gained a lot of interest over the past years. We investigate theoretically the influence of clustering on the dynamics of globular particle dispersions [1]. To this end, we systematically explore various pair potential models by a combination of state-of-the-art analytic methods in conjunction with computer simulations where the solvent-mediated hydrodynamic interactions are likewise included. Our theoretical results show that the cluster peak (intermediate-range-order peak) is present also in the hydrodynamic function characterizing the short-time dynamics, in accord with new experimental data [2]. Enhanced short-range attraction leads to a smaller self-diffusion coefficient and a larger dispersion viscosity. The behavior of the (generalized) sedimentation coefficient is more intricate, e.g. showing a non-monotonic interaction strength dependence.

[1] J. Riest & G. Nägele, *Soft Matter* (2015). doi:10.1039/C5SM02099A

[2] Collaboration with D. Godfrin (NIST & MIT), Y. Liu (NIST) and N. Wagner (UDEL), work in progress

Riest Jonas
Institute of Complex Systems (ICS-3), Forschungszentrum Juelich GmbH, 52425 Juelich, Germany

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