

**On kinetic models for dilute suspensions of rigid rods.**

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(joint work with F. Otto - Univ. of Bonn).

ABSTRACT: We discuss the existence theory for certain kinetic models for the modeling of dilute suspensions of rigid rods. The model consists of a coupled Smoluchowski equation describing the evolution of a micro-scale together with Stokes flow for the motion of the solvent. For certain parameter values, the velocity gradient versus stress relation defined by the stationary and homogeneous flow is not rank-one monotone. We consider the evolution of possibly large perturbations of stationary flows and prove that, even in absence of a microscopic cut-off, discontinuities in the velocity gradient cannot occur in finite time.