

## Oberseminar Numerik am 24.05.2012

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“A kinetic transport model of actin-myosin interactions”

### **Abstract:**

Based on the behavior of individual myosin monomers imbedded in myosin bundles and acting on actin filaments, a kinetic transport model is formulated, describing the sliding filament mechanism. It accounts both for the attachment/detachment kinetics of myosin heads and for the mechanics leading to the sliding motion. The model has the favorable property of a closed ODE system of equations for the macroscopic moments, containing the essential nonlinearities, which allow the description of instabilities observed in in-vitro experiments. The kinetic model possesses measure solutions, which can be computed explicitly in terms of the moments. Long time convergence to equilibrium (providing force-velocity relations) and a macroscopic limit, eliminating the velocity variable, are carried out rigorously.