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*Multiscale modelling of dynamical networks: From agent-based to continuum models*

We aim to derive macro- and meso- models starting from an agent-based model (ABM) for complex networks composed of collagen fibers. The ABM features apolar fiber elements having the ability to connect and disconnect to its crossing neighbors and interacting through nematic alignment with their linked neighbors. We first formally derive a kinetic model for the fiber and cross-links distribution functions.

The diffusion limit of the kinetic model, in a regime of fast linking/unlinking, leads to a macroscopic model consisting of a system of nonlinear diffusion equations for the fiber density and mean orientation.