

Actin filament density evolution – Analysis of a system of non-linear PDEs

In this talk I will present a pde-model describing the nucleation and degradation of actin-filaments at the leading edge of a crawling cell. The resulting non-linear 2d-system of pdes will be analysed with regards to the following questions: Global long term behaviour? Existence and uniqueness of (stationary) solutions? Influence of branching rate (bifurcation parameter)? Different behaviour for different (biologically meaningful) boundary conditions?

Finally I will demonstrate how this sub-model is used in a complex full-cell model capable of simulating stationary and moving cells as well as the transition between these states.