Mathematics and CS Seminar

Regularity and Convergence to Equilibrium for Chemical Reaction-Diffusion Systems

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Host: Julian Fischer

This talk presents some recent advances concerning the regularity and large time behaviour of reaction-diffusion systems arising from chemical reaction network theory or biology. In the first part, it is shown that if a reaction-diffusion system preserves the nonnegativity, dissipates the total mass and has at most quadratic nonlinearities, then the local classical solution exists globally, and is bounded uniformly in time in all dimensions. This deduces in particular the well-posedness of the binary reversible reaction A + B C + D or the skew-symmetric Lotka-Voltera system. The second part is devoted to the convergence to equilibrium for so-called complex balanced chemical reaction systems. By utilising the entropy method, it is proved that all renormalized solutions converge exponentially to the unique positive equilibrium provided the absence of boundary equilibria. Some special systems possessing boundary equilibria are also discussed.

Monday, June 24, 2019 04:00pm - 06:30pm
Heinzel Seminar Room / Office Bldg West (I21.EG.101)

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