STEVENS Institute of Technology

Arthur E. Imperatore School of Sciences and Arts

Department of Mathematical Sciences

Seminar in Nonlinear Systems

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Variational Non-Equilibrium Thermodynamics for Reaction-Diffusion Systems

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Abstract: In many situations the evolution of non-equilibrium systems can be described by a master equation provided there is a sharp separation of time scales. The main quantity is the stationary probability distribution of the master equation. Explicit solutions of the master equation are very difficult to obtain. We discuss various approximations in the large volume limit, in particular the Kubo approximation. We define an information potential which generalizes the concept of free energy to the non-equilibrium situation; we give approximations of rate constants. These problems are discussed in the context of reaction-diffusion systems.

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