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Nonequilibrium Statistical Mechanics Using Maximum Entropy Methods MANDAR INAMDAR, EFFROSYNI SEITARIDOU, ROB PHILLIPS, California Institute of Technology, KINGSHUK GHOSH, KEN DILL, University of California, San Francisco — Phenomena like Fick's Law of diffusion, and chemical decay processes belong to the domain of nonequilibrium thermodynamics. We believe that the principle of maximum caliber, formulated by E.T. Jaynes, can provide the necessary framework to explain such processes. In this work we formulate simple models for dynamical processes like particle diffusion, heat diffusion, and chemical kinetics. Following the maximum caliber principle, we identify the phase trajectories in each case and write down the corresponding entropy. We then maximize this entropy, subject to the physical/chemical constraints involved in the process, to obtain the probability distribution for its trajectories. From this probability distribution we can get the mean value and fluctuations for the variables of interest.

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