

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Competition For Resources in a Model for Protein Synthesis

LARRY COOK, ROYCE ZIA, Virginia Tech — The Totally Asymmetric Simple Exclusion Process (TASEP) is often used to explore translation during protein synthesis. The particles represent ribosomes that move along mRNA, which is represented by the one-dimensional lattice. Unlike ordinary TASEP where the supply of particles is unlimited, there is a finite number of ribosome in a cell. In addition, there are many genes which compete for this pool of ribosomes. Thus, we are motivated to consider the effects of multiple TASEPs (of varying lengths) coupled to a single, finite reservoir of particles. In particular, the total occupation numbers, the density profiles and the particle currents of individual TASEPs are studied, as the overall reservoir of particles is varied. Both Monte Carlo simulation results and analytic considerations will be presented.

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Date submitted: 20 Nov 2008

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