

Abstract Submitted
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**Power Spectra of a Totally Asymmetric Simple Exclusion Process
with Finite Resources** L. JONATHAN COOK, ROYCE K. P. ZIA, Virginia Tech

— In a cell, a mRNA has only a finite number of ribosomes to use during protein synthesis. We take this constraint into account in the modeling of translation by a totally asymmetric simple exclusion process (TASEP). Through Monte Carlo simulations and analytical methods, we study the power spectrum of the total particle occupancy of the TASEP. New features are found, such as a severe suppression at low frequencies. We formulate a theory based on a linearized Langevin equation with discrete space and time. With good agreement between the theoretical approach and the simulations, we gain some insight in how finite resources affect a TASEP.

L. Jonathan Cook
Virginia Tech

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