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Refined mean-field approaches to "edge-effects" in open TASEP's
JIAJIA DONG, Hamline University, ROYCE K.P. ZIA, BEATE SCHMITTMANN, Virginia Tech — We study the totally asymmetric simple exclusion process (TASEP) with a defect site, hopping rate $q < 1$, at the edge of the system and particles occupying ℓ lattice sites. Using two different mean-field approximations, we analyze the behavior of the steady state current J in the presence of the defect as a function of entry rate α and q. In good agreement with Monte Carlo simulations, these two methods bring insight to understanding the significance of having one or a cluster of slow codons (unit of messenger RNA, template of protein synthesis) immediately after initiation during protein synthesis. Related work is published in Journal of Physics A, vol. 41 (2008).

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