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Tuesday, November 12, 2024 11:35 AM (30 minutes)

Title: Exponential tail estimates for quantum lattice dynamics

Abstract: We consider the quantum dynamics of a particle on a lattice for large times. Assuming translation invariance, and either discrete or continuous time parameter, the distribution of the ballistically scaled position Q(t)/t converges weakly to a distribution that is compactly supported in velocity space, essentially the distribution of group velocity in the initial state. We show that the total probability of velocities strictly outside the support of the asymptotic measure goes to zero exponentially with t, and we provide a simple method to estimate the exponential rate uniformly in the initial state.