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Floquet-Bloch theory for polymers in a periodic RICARDO PABLO PEDRO, DAVID TEMPEL, ALFREDO ALEXANDER-KATZ, Massachusetts Inst of Tech-MIT — Anderson localization in disordered systems predicts the localization of electronic wave functions and the resulting absence of diffusion. The phenomenon is much more general and has been observed in a variety of systems. In the case of the polymer, the behavior of it in a periodic potential is equivalent to the behavior of a quantum-mechanical particle in a periodic potential. According to this mapping our results for polymers in a periodic potential are valid for localization of a quantum-mechanical particle in a periodic potential. Besides, one of our motivations for studying polymers in a periodic potential is because it reveals interesting aspects of a self-organization of the adsorbed polymers onto a surface with periodic potential. In order to describe the properties of time-periodic polymer system, we consider the potential time dependent which is periodic in time and space and we evaluate the solutions using the powerful nonperturbative Floquet-Bloch theory which is formulated for linear systems. Finally, we also consider a more interesting problem of when disorder is included in the time-periodic system, where localization of the wave function can occur.

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