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Rapidly forced quantum Brownian motion MUSTANSIR BARMA, MALAY BANDYOPADHYAY, Department of Theoretical Physics, Tata Institute of Fundamental Research, Mumbai 400005, India — We study the steady state behaviour of a confined quantum Brownian particle which is subjected to a space-dependent, rapidly oscillating time-periodic force. To leading order in the period of driving, the result of the oscillating force is to produce an effective static potential which has a quantum contribution V_q which adds on to the classical result. This is shown by using a coherent state representation of bath oscillators which leads to a c-number generalized quantum Langevin equation. We evaluate V_q exactly in the case of an Ohmic dissipation bath and show that it takes on different forms in different regimes, determined by the ratio of the thermal wavelength to the spatial spread of the driving force.

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