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Intermittent lower bound on quantum diffusion. (English) Zbl 1001.81019

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Let H be a self-adjoint, bounded Hamiltonian acting on the Hilbert space $\ell^2(\mathbb{N})$. The canonical base is denoted by $(|n\rangle)_{n \in \mathbb{N}}$. The unbounded position operator on $\ell^2(\mathbb{N})$ is defined by $X|n\rangle = n|n\rangle$. The authors are interested in studying the spreading of a wave packet initially localized at $|0\rangle$ under the quantum dynamics generated by H , and analyze it with help of the moments of the time-averaged probability distribution on \mathbb{N} , notably the time-averaged expectation values of powers of X . The authors' goal is to characterize the spreading by properties of the spectral measure μ of H with respect to $|0\rangle$.

Reviewer: [Messoud Efendiev \(Berlin\)](#)

MSC:

- [81Q10](#) Selfadjoint operator theory in quantum theory, including spectral analysis
- [37N20](#) Dynamical systems in other branches of physics (quantum mechanics, general relativity, laser physics)
- [28A80](#) Fractals

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Keywords:

quantum dynamics; self-adjoint bounded Hamiltonian; spreading of a wave packet; spectral measure

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