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Loschmidt echo decay in hard-disk billiards[1] ARSENI GOUSSEV, KLAUS RICHTER, Institute for Theoretical Physics, University of Regensburg — The Loschmidt echo (LE) quantifies the sensitivity of quantum dynamics to perturbations of system's Hamiltonian. In a chaotic system it is known to exhibit exponential time decay, for a certain range of perturbation strengths, with the decay rate given by the mean Lyapunov exponent of the counterpart classical system. This phenomenon makes the LE an attractive tool for quantifying *Quantum Chaos*. To date, all existing theories for the LE strongly rely on averaging over different realizations of the Hamiltonian and/or averaging over an ensemble of initial states. Thus, a theory for the LE in pure individual chaotic systems is needed. We attempt to fill in this gap by addressing the LE in pure open quantum hard-disk billiards. We find that in such systems the LE time decay is intimately connected to Lyapunov exponents as well as to quantities characterizing escape of classical trajectories from the system's chaotic repellor. Our theoretical findings are supported by results of numerical simulations.

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