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Dynamics of relaxation and the equilibrium state in an incompletely-chaotic quantum system VLADIMIR YUROVSKY, ABRAHAM BEN-REUVEN, Tel Aviv University, MAXIM OLSHANII, University of Massachusetts Boston — An incompletely-chaotic system, with a perturbation of the integrable part that does not obey selection rules, relaxes to an equilibrium state that lies between the initial state and thermal equilibrium [1]. This behavior, which is controlled by a universal parameter, is confirmed for a system of two atoms in a circular transversally-harmonic waveguide. We analyze here the dynamics of expectation values of generic observables and their fluctuations in the long-time limit with an application to this model. The relaxation demonstrates a non-exponential behavior and its rate depends on the initial-state energy. The fluctuation amplitude decreases with increase of the initial state width.

[1] V. A. Yurovsky and M. Olshanii, Phys. Rev. Lett. 106, 025303 (2011)

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