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The Memory of Initial Conditions in an Incompletely-Chaotic Quantum System VLADIMIR YUROVSKY, Tel Aviv University, MAXIM OLSHANII, University of Massachusetts Boston — A system of two atoms in a circular, transversely harmonic waveguide in the multimode regime is analyzed [1]. While showing some signatures of the quantum-chaotic behavior, the system fails to reach a complete quantum chaos, even when the interaction between the atoms is infinitely strong. A relaxation from an initial state leads to a final state which is different from a thermal equilibrium; this state retains some memory of the initial conditions. The results inspire a more general theory of relaxation in incompletely-chaotic systems [2] of which our system is a particular case.

[1] V. A. Yurovsky and M. Olshanii, e-print:1001.0225.
[2] M. Olshanii and V. A. Yurovsky, e-print:0911.5587.

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