

**Kurlberg, Pär; Rosenzweig, Lior; Rudnick, Zeév****Matrix elements for the quantum cat map: fluctuations in short windows.** (English)[Zbl 1187.81131](#)[Nonlinearity 20, No. 10, 2289-2304 \(2007\).](#)

Summary: We study fluctuations of the matrix coefficients for the quantized cat map. We consider the sum of matrix coefficients corresponding to eigenstates whose eigenphases lie in a randomly chosen window, assuming that the length of the window shrinks with Planck's constant. We show that if the length of the window is smaller than the square root of Planck's constant, but larger than the separation between distinct eigenphases, then the variance of this sum is proportional to the length of the window, with a proportionality constant which coincides with the variance of the individual matrix elements corresponding to Hecke eigenfunctions.

**MSC:**

- [81Q50](#) Quantum chaos
- [11L40](#) Estimates on character sums
- [11M36](#) Selberg zeta functions and regularized determinants; applications to spectral theory, Dirichlet series, Eisenstein series, etc. (explicit formulas)
- [37D20](#) Uniformly hyperbolic systems (expanding, Anosov, Axiom A, etc.)
- [37N20](#) Dynamical systems in other branches of physics (quantum mechanics, general relativity, laser physics)

Cited in <b>1</b> Review Cited in <b>4</b> Documents
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