



Quantum Baker Maps for Spiraling Chaotic Motion

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We define a coupling of two baker maps through a $p=2$ rotation both in position and in momentum. The classical trajectories thus exhibit spiraling, or loxodromic motion, which is only possible for conservative maps of at least two degrees of freedom. This loxodromic baker map is still hyperbolic, that is, fully chaotic. Quantization of this map follows on similar lines to other generalized baker maps. It is found that the eigenvalue spectrum for quantum loxodromic baker map is far removed from those of the canonical random matrix ensembles.

An investigation of the symmetries of the loxodromic baker map reveals the cause of this deviation from the Bohigas-Giannoni-Schmit conjecture.

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