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ITERATION OF QUADRATIC MAPS ON MATRIX ALGEBRAS

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We study the iteration of a quadratic family in the algebra of 2 × 2 real matrices, parameterized by a matrix C. We analyze and classify the existing cycles (periodic orbits) and their dependence on the parameter matrix. We discuss how new dynamical phenomena occur as a consequence of the noncommutativity of the matrix product. In particular, we show that the commutator of the initial condition with parameter matrix C has a decisive role in the overall dynamics.

Keywords: Matrix dynamics; iterated interval maps; noncommuting attractive cycles

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