Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Lyapunov Generation of Entanglement and the Correspondence Principle CYRIL PETITJEAN, University of Geneva, Switzerland, PHILIPPE JACQUOD, Unviersity of Arizona — We show how a classically vanishing interaction generates entanglement between two initially nonentangled particles, without affecting their classical dynamics. For chaotic dynamics, the rate of entanglement is shown to saturate at the Lyapunov exponent of the classical dynamics as the interaction strength increases. In the saturation regime, the one-particle Wigner function follows classical dynamics better and better as one goes deeper and deeper in the semiclassical limit. This demonstrates that quantum-classical correspondence at the microscopic level does not require coupling to a large number of external degrees of freedom.

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Date submitted: 21 Nov 2006 Electronic form version 1.4