

Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Fractal dynamics in chaotic quantum transport ESA RASANEN, Department of Physics, Tampere University of Technology, Finland, VILLE KOTIMAKI, Department of Physics, University of Jyväskylä, Finland, HOLGER HENNIG, ERIC HELLER, Physics Department, Harvard University, USA — Despite several experiments on chaotic quantum transport, corresponding ab initio quantum simulations have been out of reach so far. Here we carry out quantum transport calculations in real space and real time for a two-dimensional stadium cavity that shows chaotic dynamics. Applying a large set of magnetic fields yields a complete picture of the magnetoconductance that indicates fractal scaling on intermediate time scales. Two methods that originate from different fields of physics are used to analyze the scaling exponent and the fractal dimension. They lead to consistent results that, in turn, qualitatively agree with the previous experimental data.

Esa Rasanen
Department of Physics, Tampere University of Technology

Date submitted: 09 Nov 2012

Electronic form version 1.4