QPhysics
AT QUEENS COLLEGE

Colloquium Notice

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Adiabatic quantization of Andreev levels

The problem of finding a semiclassical spectrum of an Andreev billiard (ballistic chaotic cavity coupled to superconductor by an N-mode construction) is considered. We identify the time T between Andreev reflections as a classical adiabatic invariant. Quantization of the adiabatically invariant torus in phase space gives a discrete set of periods Tn, which in turn generate a ladder of excited states. The largest quantized period is given be the Ehrenfest time, proportional to the logarithm of the Plank constant. The wave functions of Andreev levels fill the cavity in a highly nonuniform "squeezed" way, which has no counterpart in normal state chaotic or regular billiards. The theory is applied to the problems of calculating a hard gap in the semiclassical spectrum and crossover between semiclassical and random matrix description of Andreev billiards. Similar ideas may be used for the description of classical to quantum crossover in shot noise in a ballistic quantum dot.

Notes: Starts at 2:00 PM. Room: B-137

Tuesday
February 18, 2003
Starts at **2:00 pm**
Coffee at **2:00 pm**
Physics Conference Room, SB B326