M. Thaha and R. Blümel, Bull. Am. Phys. Soc. 39, 605 (94)

Abstract Submitted
for the March 1994 Meeting of the
American Physical Society
21-25 March, 1994

Suggested Session Title
Localization in low D systems,
Chaos

March Sorting Category

17e, 18b

Nonuniversality of localization length in a quantum chaotic system.

M. Thaha, R. Blümel, Department of Physics and Astronomy, University of Delaware. --- Breaking an antiunitary symmetry modifies the localisation length. In anology to results obtained recently in the context of Anderson localization in disorderd solids, we establish that the localization length λ of a dynamically localizing quantum systems depends on the invariance properties of the system under antiunitary symmetry operations. We consider a Hamiltonian system—a modified version of the kicked rotor—which, by tuning its parameters, can change its invariance properties in a manner similar to the (Gaussian orthogonal ensemble) →(Gaussian unitary ensemble)→(Gaussian sympletic ensemble) transitions ($\beta = 1 \rightarrow \beta = 2 \rightarrow \beta = 4$) in Dysons theory of random matrices. We find that λ, as long as the Kramers degeneracy is not broken, depends on the universality class according to $\lambda(\beta) = \beta\lambda(\beta = 1)$. When Kramers degeneracy is broken, we find nonuniversal changes in the localization length.

Antonia Tsoukatos
Signature of APS Member

Antonia Tsoukatos
Same Name Typewritten

University of Delaware
Dept. of Physics & Astronomy
Newark, DE 19716
Address

( )Prefer Poster Session
(X)Prefer Standard Session
( )No preference