

Chaos in a Stadium-Shaped 2-D Quantum Dot

Authors : Roger Yu

Abstract : A numerical scheme has been developed to solve wave equations for chaotic systems such as stadium-shaped cavity. The same numerical method can also be used for finding wave properties of rectangle cavities with randomly placed obstacles. About 30k eigenvalues have been obtained accurately on a normal circumstance. For comparison, we also initiated an experimental study which determines both eigenfrequencies and eigenfunctions of a stadium-shaped cavity using pulse and normal mode analyzing techniques. The acoustic cavity was made adjustable so that the transition from nonchaotic (circle) to chaotic (stadium) waves can be investigated.

Keywords : quantum dot, chaos, numerical method, eigenvalues

Conference Title : ICPM 2022 : International Conference on Physics and Mathematics

Conference Location : Paris, France

Conference Dates : June 23-24, 2022