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Complex billiard. (Russian) Zbl 0606.35018
Probl. Mat. Fiz. 11, 138-164 (1986).

The Dirichlet problem is considered for the Helmholtz equation in an unbounded region with radiation condition at infinity. The quantization conditions are formulated which makes it possible in some cases to obtain the quasiclassical asymptotic form of complex "eigenvalues", i.e., the poles of the Green function whose imaginary parts are related to radiation losses. In the case of a bounded domain with symmetry axis these quantum conditions lead to splitting of eigenfrequencies of interacting symmetry quasiclassical oscillations with nonoverlapping oscillation zones. The construction is based on a complexification of the phase space of a billiard related to the given domain and on the consideration of a special type of Lagrange subvarieties in this complexification. All constructions are nonrigorous.

Reviewer: O.Dumbrajs

MSC:

- 35J05** Laplace operator, Helmholtz equation (reduced wave equation), Poisson equation Cited in 1 Document
- 35P05** General topics in linear spectral theory for PDEs

Keywords:

Dirichlet problem; Helmholtz equation; radiation condition; quasiclassical asymptotic form; Green function; symmetry quasiclassical oscillations; billiard