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Exponentially small splitting of eigenvalues of the Laplace operator corresponding to two natural oscillations of "jumping ball" type. (Russian) [Zbl 0602.58051](#)

Probl. Mat. Fiz. 11, 261-269 (1986).

Asymptotic expressions are derived for the exponential splitting of eigenvalues of the Laplace operator in the two-dimensional region under the condition that in the region natural oscillations arise which correspond to two invariant Lagrange tori of the corresponding classical billiard and have in the quasiclassical approximation double eigenvalues. It is assumed that a substantial part of the boundary of the region differs slightly from the sections of parallel lines. It is shown that the exponentially small splitting arises because of the "tunneling" interaction of oscillations through the connecting zone.

Reviewer: O.Dumbrajs

MSC:

58J50 Spectral problems; spectral geometry; scattering theory on manifolds

35Q99 Partial differential equations of mathematical physics and other areas of application

Keywords:

Asymptotic expressions; exponential splitting of eigenvalues of the Laplace operator; natural oscillations; invariant Lagrange tori