Alessandrini, Giovanni

Nodal lines of eigenfunctions of the fixed membrane problem in general convex domains. (English) Zbl 0838.35006

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Summary: We describe the boundary behavior of the nodal lines of eigenfunctions of the fixed membrane problem in convex, possibly nonsmooth, domains. This result is applied to the proof of Payne's conjecture on the nodal line of second eigenfunctions, by removing the C^∞ smoothness assumption which is present in the original proof of *A. D. Melas* [J. Differ. Geom. 35, No. 1, 255-263 (1992; Zbl 0769.58056)].

MSC:

35B05	Oscillation, zeros of solutions, mean value theorems, etc. in context of PDEs
35P05	General topics in linear spectral theory for PDEs
35J05	Laplace operator, Helmholtz equation (reduced wave equation), Poisson equation
58J50	Spectral problems; spectral geometry; scattering theory on manifolds
35J67	Boundary values of solutions to elliptic equations and elliptic systems

Keywords:

boundary behavior of nodal lines; second eigenfunctions

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