

**ON AN EIGENVALUE FOR THE LAPLACE OPERATOR IN A DISK WITH
DIRICHLET BOUNDARY CONDITION ON A SMALL PART OF THE
BOUNDARY IN A CRITICAL CASE**

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A boundary-value problem of finding eigenvalues is considered for the negative Laplace operator in a disk with Neumann boundary condition on almost all circle except for a small arc of vanishing length, where the Dirichlet boundary condition is imposed. Complete asymptotic expansions with respect to a parameter (the length of the small arc) are constructed for an eigenvalue of this problem; the eigenvalue converges to a double eigenvalue of the Neumann problem.

Keywords: Laplace operator, singular perturbation, small parameter, eigenvalue, asymptotics.

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