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ON THE EIGENVALUE PROBLEM FOR ELLIPTIC OPERATOR WITH VARIABLE COEFFICIENTS AND INTEGRAL BOUNDARY CONDITIONS

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The talk deals with further development of the structure of spectrum for two-dimensional operator with integral conditions:

$$\frac{\partial}{\partial x}\big(p_1(x,y)\frac{\partial u}{\partial x}\big)+\frac{\partial}{\partial y}\big(p_2(x,y)\frac{\partial u}{\partial y}\big)+\lambda u=0,\quad (x,y)\in D=\{0\le x,y\le 1\},$$
$$u(0,y)=\gamma_1\int_0^1\alpha(x,y)u(x,y)\mathrm{d}x,\quad u(1,y)=\gamma_2\int_0^1\beta(x,y)u(x,y)\mathrm{d}x,$$
$$u(x,0)=u(x,1)=0.$$

Note, that in the case of $p_1=p_2=\alpha=\beta=1$, the spectrum of this operator consists only of positive eigenvalues under the condition $-\infty<\gamma_1+\gamma_2<\gamma_0\approx 3.42$.

Our objective is to investigate some cases for the functions p_1,p_2,α,β and to estimate, in which cases it is possible to increase number γ_0. These results are obtained generalizing our former investigations in the case of one-dimentional eigenvalue problem [1]. Newly obtained results of the investigation of the structure of spectrum we apply for the solution of the systems of difference equations by iterative methods. Similar results were obtained in [2].

REFERENCES

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