On Fredholm One-Dimensional Boundary-Value Problems with Parameter in Sobolev Spaces

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We consider the family of boundary-value problems depending on the parameter $\varepsilon \in [0, \varepsilon_0)$, where $\varepsilon_0 > 0$. With this problem, we associate a Fredholm linear continuous operator with zero index.

We prove a constructive criterion of invertibility of the operator for sufficiently small ε. We find a constructive criterion for the solution of the boundary-value problem to be continuous with respect to the parameter ε at $\varepsilon = 0$. We also prove that the error and discrepancy of the solution to the boundary-value problem are of the same degree as $\varepsilon \to 0+$ [1].

The talk is based on the results obtained together with Professor V. A. Mikhailets.

1. Atlasiuk O. M., Mikhailets V. A. Fredholm one-dimensional boundary-value problems with parameter in Sobolev spaces. Ukrainian Mathematical Journal, 2018, 70, 1457 – 1465.