

On the solvability of a class of linear fourth-order boundary value problems with accretive operators

Mohammed Benharrat

The purpose of this talk is to investigate a class of fourth-order differential-operator equations with an m -accretive operator source in a Hilbert space setting, subject to appropriate boundary conditions. We aim to analyze the existence and regularity of solutions, establish trace theorems for their boundary values, and derive integral representation formulas.

Using a splitting operator method, the equation is transformed into a system of two coupled second-order equations: the first is elliptic, while the second is hyperbolic. These equations are not directly amenable to standard methods. In our analysis, we solve the coupled second-order hyperbolic and elliptic system in order to obtain an explicit solution to the considered problem.

Our approach is based on fractional powers of m -accretive operators, techniques involving holomorphic semigroups generated by such operators, and the theory of strongly continuous cosine operator functions.

References

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First Author: Mohammed, Benharrat

Affiliation: National Polytechnic School of Oran - Maurice Audin
31000, Algeria

e-mail: mohammed.benharrat@enp-oran.dz