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OPTIMAL SOLUTION METHODS FOR ADJOINT PROBLEMS IN WEIGHTED HARDY CLASSES

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ABSTRACT

This work examines a boundary value problem within the theory of analytic functions in the unit disk:

$$F^+(\tau) + G(\tau) \cdot F^-(\tau) = 0, \quad \|\tau\| = 1.$$

Here, $G(\tau)$ is a given function defined on the unit circle, while $F^{\pm}(z)$ represent the boundary values of functions analytic inside and outside the unit disk, respectively. The problem has been studied in Hilbert spaces (H^p), with methods developed to solve it under more general classes of $G(\tau)$. A.P. Soldatov extended the analysis by considering solutions in weighted Hilbert spaces, introducing additional complexity and generality. Such boundary value problems are closely related to Riemann–Hilbert equations, singular integral equations, and operator theory.

Keywords Biorthogonal system · Bassel basis · Piecewise Hölder functions

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