

THE SCHWARZ PROBLEM AND HIGHER-ORDER EXTENSIONS FOR THE BELTRAMI OPERATOR IN THE HALF UNIT DISC

Bahriye Karaca

*Fundamental Sciences, Faculty of Engineering and Architecture,
Izmir Bakircay University, Izmir, Turkey
bahriye.karaca@bakircay.edu.tr,
bahriyekaraca@gmail.com
ORCID:0000-0003-4463-8180*

ABSTRACT

This study explores the Schwarz problem for the Beltrami operator within the upper half of the unit disc in the complex plane, a domain that is crucial for understanding complex analytic functions and their applications. We begin by deriving the solution to this boundary value problem, providing explicit expressions and necessary conditions for its solvability. This involves applying advanced techniques in complex analysis to solve the Schwarz problem and extending these results to second-order equations.

Additionally, we extend our findings to higher-order cases, which involves addressing more complex boundary value problems related to the Beltrami operator. This extension is achieved by generalizing the solution techniques used for the Schwarz problem and incorporating them into the analysis of higher-order differential equations.

Keywords Beltrami Operator, Half Unit Disc, Schwarz Problem, Boundary Value Problems

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