Starlikeness Of A General Integral Operator On
Meromorphic Multivalent Functions

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Abstract

We define a new integral operator \( F_{p, \delta_1, \ldots, \delta_m}(f_1, \ldots, f_n) \) for meromorphic multivalent functions in the punctured open unit disk. The starlikeness condition for this integral operator is determined. Several special cases are also discussed in the form of Corollaries.

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1 Introduction

Let \( \Sigma_p \) denote the class of all meromorphic functions of the form

\[
f(z) = \frac{1}{z^p} + \sum_{k=0}^{\infty} a_k z^k \quad (p \in \mathbb{N} = \{1, 2, \ldots\}),
\]

which are analytic and \( p \)-valent in the punctured open unit disk

\[
U^* = \{ z \in \mathbb{C} : 0 < |z| < 1 \} = U \setminus \{0\},
\]

where \( U \) is the open unit disk \( U = \{ z \in \mathbb{C} : |z| < 1 \} \). In particular, we set \( \Sigma_1 = \Sigma \).

A function \( f \in \Sigma_p \) is said to be meromorphic \( p \)-valent starlike and belongs to the class \( MS^*_p \), if it satisfies the inequality:

\[
-\Re \left\{ \frac{zf'(z)}{f(z)} \right\} > 0.
\]

A function \( f \in \Sigma_p \) is said to be meromorphic \( p \)-valent convex and belongs to the class \( MC_p \), if it satisfies the inequality:

\[
-\Re \left\{ 1 + \frac{zf''(z)}{f'(z)} \right\} > 0.
\]