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Starlikeness Of A General Integral Operator On Meromorphic Multivalent Functions

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Abstract

We define a new integral operator $\mathcal{F}^p_{\delta_0,...,\delta_m}(f_1,...,f_n)$ 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 Σ_p denote the class of all meromorphic functions of the form

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

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

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

where $\mathbb{U}$ is the open unit disk $\mathbb{U} = \{z \in \mathbb{C} \ : \ |z| < 1\}$. 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 $\mathcal{MS}^*_p$, 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 $\mathcal{MC}_p$, if it satisfies the inequality:

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

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