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Differential Subordination and Superordination Results for Higher-Order Derivatives of p-Valent Functions Involving a Generalized Differential Operator

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Abstract. The purpose of this paper is to obtain some subordination, superordination and sandwich results for higher-order derivatives of $p-$valent functions involving a generalized differential operator. Some of our results generalize previously known results.

Keywords: Analytic function; Hadamard product; Differential subordination; Superordination; Sandwich theorems; Linear operator.

1. Introduction

Let $H(U)$ be the class of analytic functions in the open unit disk $U = \{z \in \mathbb{C} : |z| < 1\}$ and let $H[a,p]$ be the subclass of $H(U)$ consisting of functions of the form:

$$f(z) = a + a_p z^p + a_{p+1} z^{p+1} ... \ (a \in \mathbb{C};\ p \in \mathbb{N} = \{1, 2, ...\}).$$

For simplicity $H[a] = H[a,1]$. Also, let $\mathcal{A}(p)$ be the subclass of $H(U)$ consisting