

An extension operator of Roper-Suffridge and Graham-Kohr type

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Abstract

In this paper, we generalize the Roper-Suffridge-Graham-Kohr extension operator, $f \mapsto \Psi_{n,\alpha,\beta}$, where f is normalized locally univalent function on the unit disc of the complex plane and

$$\Psi_{n,\alpha,\beta}(f)(z) = \left(f(z_1), \left[\frac{f(z_1)}{z_1} \right]^\alpha [f'(z_1)]^\beta \tilde{z}, \right),$$

where $z = (z_1, \tilde{z})$ belongs to the unit ball of \mathbb{C}^n .

We address to the problem of preserving starlikeness and convexity through the new operator. The newly introduced operator provides a new method for constructing starlike functions on the unit ball of \mathbb{C}^n . Also, we improve the result regarding preservation of starlikeness in case of extension operator $\Psi_{n,\alpha,\beta}$. Finally, we propose an open problem and present a brief introductory study on it.