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An integral operator preserving functions with bounded argument rotation [1]

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Abstract

Let A be the class of functions f, which are analytic in the unit disc $\Delta = \{|z| < 1\}$, with $f(0) = 0$ and $f'(0) = 1$. Let B be the class of functions f, which are analytic in the unit disc Δ, with $f(0) = 1$. Let $R = \{f \in A : \Re f'(z) > 0, z \in \Delta\}$. Let $g \in A$ with $g(z)/z \neq 0$ in Δ, $h \in B$, and consider the integral operator $I : A \to A$, where $F = I(f)$ is defined by

$$F(z) = \int_0^z \frac{f(t)h(t)}{g(t)}dt$$

We obtain certain sufficient conditions on g and h so that $I(R) \subset R$. For $h(z) = 1, z \in \Delta$, such conditions are known.

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