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A note on Ruscheweyh type of integral operators for uniformly α-convex functions. (English)

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Let A denote the class of functions $f(z)=z+a_2z^2\cdots$ analytic in the unit disk U, $f\in U$ is uniformly α-convex iff

$$\text{Re}\{(1-\alpha)(z-\zeta)f'(z)/(f(z)-f(\zeta))+\alpha(1+(z-\zeta)f''(z))/f'(z))\}>0$$

for all $z,\zeta\in U$ and $0\leq\alpha\leq 1$. In this note the authors consider the integral operator

$$F(z)=(F_\alpha(z,\zeta)-F_\alpha(0,\zeta))/F'_\alpha(0,\zeta),$$

where $\alpha>0$ and

$$F_\alpha(z,\zeta)=\left\{(c+1/\alpha)/(z-\zeta)^c\int_\zeta^z(t-\zeta)^{c-1}(f(t)-f(\zeta))^{1/\alpha}dt\right\}^\alpha$$

$(z\in U,\,\zeta\in U$ fixed and $z=\zeta)$ and prove that F is a uniformly α-convex function when f is a uniformly α-convex function.

Reviewer: O.Fekete (Freiburg)

MSC:

30C45 Special classes of univalent and multivalent functions of one complex variable (starlike, convex, bounded rotation, etc.)

Keywords:

α-convex functions; integral operator; uniformly α-convex functions

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