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On some Chebyshev type inequalities for the complex integral. (English) Zbl 1452.26019

Summary: Assume that $f$ and $g$ are continuous on $\gamma$, $\gamma \subset \mathbb{C}$ is a piecewise smooth path parametrized by $z(t)$, $t \in [a, b]$ from $z(a) = u$ to $z(b) = w$ with $w \neq u$, and the complex Chebyshev functional is defined by

$$D_\gamma(f, g) := \frac{1}{w - u} \int_\gamma f(z)g(z)dz - \frac{1}{w - u} \int_\gamma f(z)dz \frac{1}{w - u} \int_\gamma g(z)dz.$$

In this paper we establish some bounds for the magnitude of the functional $D_\gamma(f, g)$ under Lipschitzian assumptions for the functions $f$ and $g$, and provide a complex version for the well known Chebyshev inequality.

MSC:

26D15 Inequalities for sums, series and integrals
26D10 Inequalities involving derivatives and differential and integral operators
30A10 Inequalities in the complex plane

Keywords:

complex integral; continuous functions; holomorphic functions; Chebyshev inequality

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