ON A ČEBYŠEV–TYPE FUNCTIONAL AND GRÜSS–LIKE BOUNDS

P. CERONE

Abstract. The classic Čebyshev functional involves the difference between the integral mean of the product of two functions and the product of the integral means of the individual functions. A Čebyshev-type functional involving the arithmetic average of the upper and lower bounds of one of the functions rather than the integral mean is examined, providing sharp Grüss-like bounds. The current investigation is undertaken within a measurable space setting. The results are capitalised under a variety of scenarios and in particular in obtaining sharp Grüss-like bounds for perturbed rules in numerical integration.

Key words and phrases: Čebyshev functional, sharp bounds, measurable functions, Grüss inequality, Lebesgue integral, perturbed rules.

REFERENCES


[16] G. Grüss, Über das Maximum des absoluten Betrages von \( \frac{1}{b-a} \int_a^b f(x)g(x)dx - \frac{1}{(b-a)^2} \int_a^b f(x)dx \int_a^b g(x)dx \), Math. Z., **39** (1935), 215–226.


