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**Pinkus, A.; Shisha, O.**


**A variation on the Chebyshev theory of best approximation.**


Constructive function theory, Proc. int. Conf., Varna/Bulg. 1981, 479-481 (1983).

[For the entire collection see Zbl 0529.00021.]



The authors propose a new method of approximation which maintains the geometric flavor of Chebyshev's characterization of the best uniform approximation while using an $L_q$-type measure of distance. More specifically, let $|||f||| = \max\{|\int_a^b f(x)dx| : 0 \le a \le b \le 1,\ f(x) > 0$ on (a,b) or $f(x) < 0$ on (a,b)$\}$ and $|||f|||^* = \max\{|\int_a^b f(x)dx| : 0 \le a \le b \le 1,$ f(x)$\geq$ 0 on (a,b) or f(x)$\leq$ 0 on (a,b)$\}$. Then the authors prove two alternation type characterization theorems for best approximation to $f \in C[0,1]$ from the space $\Pi_n$ of algebraic polynomials using as measures the distance functions $|||\cdot|||$ and $|||\cdot|||^*$. A de la Vallée Poussin type of theorem is also given. The "cost" for these characterization theorems is that neither $|||\cdot|||$ nor $|||\cdot|||^*$ is a norm.

*M.S.Henry*



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