SUPERDENSE UNBOUNDED DIVERGENCE OF THE BEST CHEBYSHEV APPROXIMATION WITH RESPECT TO A CLASS OF NODE MATRICES

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2000 Mathematics Subject Classification. 41A10

Keywords and phrases. Chebyshev best approximation, superdense set, unbounded divergence

Given a node matrix $\mathcal{M}$ in $[-1, 1]$ so that each n-th row J_n of $\mathcal{M}$ has at least $n+1$ points, let us define the operators T_n from C into $\mathcal{P}_n$, $n \geq 1$, as follows: for each f in C and $n \geq 1$, $T_n f$ is the unique polynomial of $\mathcal{P}_n$ for which the infimum of the set

$$\{\max\{|f(x) - P(x)| : \ x \in J_n\} : \ P \in \mathcal{P}_n\}$$

is attained.

The aim of this paper is to establish the superdense unbounded divergence of the operators T_n, $n \geq 1$, with respect to some node matrices $\mathcal{M}$ whose rows J_n have at least $n+2$ points (the case card$J_n = n+1$ leads to the classical Lagrange operators). The double condensation of singularities involving the operators T_n will be discussed, too. We remark that these results contrast with the well-known theorem concerning the uniform convergence of the best approximating polynomials in supremum norm.