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The Cesàro Operator on local Dirichlet spaces

The family of Cesàro operators σ_n^α , $n \geq 0$ and $0 \leq \alpha \leq 1$, consists of finite rank operators on Banach spaces of analytic functions on the open unit disc. We investigate these operators as they act on the local Dirichlet spaces \mathcal{D}_ζ . It is well-established that they provide a linear approximation scheme when $\alpha > \frac{1}{2}$, with the threshold value $\alpha = \frac{1}{2}$ being optimal. We strengthen this result by deriving precise asymptotic values for the norm of these operators when $\alpha \leq \frac{1}{2}$, corresponding to the breakdown of approximation schemes. Additionally, we establish upper and lower estimates for the norm when $\alpha > \frac{1}{2}$.

This is joint work with Eugenio Dellepiane, Javad Mashreghi, and Mostafa Nasri.