



KOROVKIN-TYPE APPROXIMATION VIA IDEAL α - AND α^* -CONVERGENCE ON COMPACT INTERVALS

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Abstract. We study Korovkin-type approximation of continuous functions on a compact interval through ideal α -convergence and ideal α^* -convergence. Recent work on generalized continuous convergence by means of ideals introduced several new modes of convergence for sequences of functions and clarified their function-theoretic behaviour. Our aim is to show that the compact-interval setting also admits a direct approximation-theoretic treatment. We first prove two transfer principles showing that $\mathcal{I}$ -convergence and $\mathcal{I}^*$ -convergence in the supremum norm imply $\mathcal{I}_\alpha$ -convergence and $\mathcal{I}_\alpha^*$ -convergence, respectively. We then apply these principles to positive linear operators and obtain Korovkin-type approximation theorems based on the classical test functions 1, x , and x^2 . The abstract theory is illustrated by Bernstein operators. In addition, a sparse perturbation example shows that ideal α^* -approximation may hold even when ordinary uniform convergence fails. These results provide a direct link between ideal α -type convergence and Korovkin approximation on compact intervals.

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