

Iterates of the multidimensional Cesàro operator

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ABSTRACT.

The iterates of the Cesàro operator were studied recently (see Fontes, F. G. and Solís, F. J., *Iterating the Cesàro operators*, Proc. Amer. Math. Soc., **136** (2008), No. 6, 2147–2153) on some subsets of $s(\mathbb{C})$, on $(C[0, 1], \mathbb{C})$ and on $C([0, \infty[, \mathbb{C})$. They proved that under suitable conditions the sequence of iterates converges to a constant function. In [András, Sz. and Rus, I. A., *Iterates of Cesàro operators*, Fixed Point Theory, **11** (2010), No. 2, 171–178] the authors gave some more general results regarding the convergence of the iterates by proving that the Cesàro operator is a contraction on a dense subset of $(C[0, 1], \mathbb{B})$, equipped with a well chosen norm, where \mathbb{B} is a Banach space. The convergence of iterates for some general averaging operators involving one variable functions was also investigated by Sz. András and I. A. Rus in [*Iterates of Cesàro operators*, Fixed Point Theory, **11** (2010), No. 2, 171–178]. The aim of this paper is to prove similar results involving Cesàro operators and general averaging operators for several variable functions.

The proofs are suggested by the characterization theorem of weakly Picard operators on an L -space (see Rus, I. A., *Picard operators and applications*, Sci. Math. Jpn., **58** (2003), 191–219) and the method can be applied also in the study of some singular integral equations.

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