ITERATES OF CESÁRO OPERATORS,
VIA FIXED POINT PRINCIPLE

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Abstract. In a paper by F. Galaz Fontes and F.J. Solís (Iterating the Cesáro operators, Proc. Amer. Math. Soc., 136(2008), No. 6, 2147-2153) the authors study the iterates of Cesáro operators on some subsets of $s(C)$ ($c(C)$, $c_0(C)$, $l^\infty(C)$), on $C([0,1], C)$ and on $C([0,\infty], C)$. In this paper we study the iterates of Cesáro operators on $s(B)$, on $C([0,1], B)$ and on $C([0,\infty], B)$, where $(B, \| \cdot \|)$ is a Banach space and $s(B)$ is the set of all sequences with elements in $B$. We use the contraction principle on a metric space and on a gauge space and we prove the convergence of the sequence of iterates on the whole space (endowed with a weaker topology). Our proofs are suggested by the characterization theorem of weakly Picard operators on an $L$-space (I.A. Rus, Picard operators and applications, Sci. Math. Jpn., 58(2003), 191-219) and our method can be applied to a more general class of averaging operators.

Key Words and Phrases: Cesáro operators, iterate operators, fixed point, weakly Picard operators.

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References


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