Mursaleen

**On some new invariant matrix methods of summability.** (English) Zbl 0539.40006

Q. J. Math., Oxf. II. Ser. 34, 77-86 (1983).

Let $\sigma$ be a mapping of the set of positive integers into itself. A continuous linear functional $\phi$ on the space $\ell^\infty$ of real bounded sequences is a $\sigma$-mean if $\phi(x) \geq 0$ when the sequence $x = (x_n)$ has $x_n \geq 0$ for all n, $\phi(e) = 1$ where $e := (1, 1, ...)$, and $\phi((x_{\sigma(n)})) = \phi(x)$ for all $x \in \ell^\infty$. Let $V_\sigma$ be the space of bounded sequences all of whose $\sigma$-means are equal, and let $\sigma$-lim x be the common value of all $\sigma$-means on x. In the special case in which $\sigma(n) := n + 1$ the $\sigma$-means are exactly the Banach-limits, and $V_\sigma$ is the space of all almost convergent sequences considered by *G. G. Lorentz* [Acta Math. 80, 167-190 (1948; Zbl 0031.29501)]. In a natural way the author of this paper introduces the space $BV_\sigma$ of sequences of $\sigma$-bounded variation, which is a Banach space. Then he characterizes all real infinite matrices A, which are absolutely $\sigma$-conservative (absolute $\sigma$-regular). Thereby A is said to be absolutely $\sigma$-conservative if and only if $Ax \in BV_\sigma$ for all $x \in bv$, where bv denotes the space of sequences of bounded variation, and A is said to be absolutely $\sigma$-regular if and only if A is absolutely $\sigma$-conservative and $\sigma - \lim Ax = \lim x$ for all $x \in bv$.

Reviewer: J.Boos

**MSC:**

40C05 Matrix methods for summability
40C99 General summability methods
40D25 Inclusion and equivalence theorems in summability theory



**Keywords:**

invariant means; inclusion theorems; sigma-convergence; almost convergence; absolutely sigma-conservative matrices; sequences of sigma-bounded variation

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