

On Tauberian Theorems for Cesàro Summable Double Sequences of Fuzzy Numbers

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Developed based on the concept of fuzzy sets which was discovered and introduced by Zadeh, fuzzy set theory have received more and more attention from researchers who have intended to apply the concept of fuzziness to individual works with different aspects from theoretical to practical in almost all scientific areas. One of the areas which the concept of fuzziness was practised is the summability theory, as well. In this talk, we recall some notations, basic definitions and theorems with respect to fuzzy numbers and its double sequences. In the sequel, we prove a Tauberian theorem for $(C, 1, 1)$ summability of double sequences of fuzzy numbers. Finally, we define the slow oscillation of a double sequence of fuzzy numbers in different senses and prove that the slow oscillation in some sense is a Tauberian condition for $(C, 1, 1)$ summability method. We also give a classical Tauberian theorem in Landau’s type for $(C, 1, 1)$ summability method.

References

- [1] Didier Dubois and Henri Prade, Fuzzy sets and systems, Academic Press, New York-London, 1980.
- [2] Roy H. Jr. Goetschel and William Voxman, Elementary fuzzy calculus, Fuzzy Sets Syst., vol.18, no.1, 1986, 31–43.

- [3] Marian Matlako, Sequences of fuzzy numbers, BUSEFAL, vol.28, 1986, 28–37.
- [4] Ferenc Móricz, Tauberian theorems for Cesàro summable double sequences, Studia Math., vol.110, 1994, 83–96.
- [5] Ekrem Savaş, A note on double sequences of fuzzy numbers, Turkish J. Math., vol.20, 1996, 175–178.
- [6] Papagudi Venkatachalam Subrahmanyam, Cesàro summability of fuzzy real numbers, J. Anal., vol.7, 1999, 159–168.
- [7] Binod Chandra Tripathy and Amar Jyoti Dutta, On fuzzy real-valued double sequence spaces, Soochow J. Math., vol.32, no.4, 2006, 509–520.
- [8] Lofti A. Zadeh, Fuzzy sets, Inf. Control, vol.8, 1965, 29–44.