

ON $(\lambda, \eta)(f)$ -STATISTICAL CONVERGENCE OF DOUBLE SEQUENCES IN 2-NORMED LINEAR SPACES

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Abstract. In this study, we utilize modulus functions under various conditions to define $(\lambda, \eta)(f)$ -statistical convergence of double sequences in 2-normed linear spaces. Additionally, we explore the relationships between the sets of $(\lambda, \eta)(f)$ -statistically convergent sequences and $(\lambda, \eta)(f)$ -statistically bounded sequences in 2-normed linear spaces.

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REFERENCES

- [1] A. AIZPURU, M. C. LISTÁN-GARCÍA, F. RAMBLA-BARRENO, *Density by moduli and statistical convergence*, Quaest. Math., **37**, (2014), 525–530.
- [2] F. BAŞAR, *Summability Theory and its Applications*, 2nd edition, CRC Press/Taylor & Francis Group, Boca Raton, London, New York, 2022.
- [3] H. FAST, *Sur la convergence statistique*, Colloq. Math., **2**, (1951), 241–244.
- [4] V. A. KHAN AND N. KHAN, *On some \mathcal{I} -convergent double sequence spaces defined by a modulus function*, Engineering, **5**, (2013), 35–40.
- [5] G. KILINÇ AND I. SOLAK, *Some double sequence spaces defined by a modulus function*, General Math. Notes, **35**, no. 2 (2014), 19–30.
- [6] S. PEHLIVAN AND B. FISHER, *Some sequences spaces defined by a modulus*, Math. Slovaca, **45**, (1995), 275–280.
- [7] J. MADDOX, *Sequence spaces defined by a modulus*, Math. Proc. Camb. Philos. Soc., **100**, no. 1 (1986), 161–166.
- [8] H. NAKANO, *Concave modulars*, J. Math. Soc. Japan, **5**, no. 1 (1953), 29–49.
- [9] M. MURSALEEN, λ -statistical convergence, Math. Slovaca, **50**, (2000), 111–115.
- [10] S. GÄHLER, *2-metrische Räume und ihre topologische Struktur*, Math. Nachr., **26**, (1963), 115–148.
- [11] S. GÄHLER, *Linear 2-normietre Räume*, Math. Nachr., **28**, (1965), 1–43.
- [12] H. GUNAWAN AND M. MASHADI, *On finite dimensional 2-normed spaces*, Soochow J. Math., **27**, (2001), 321–329.
- [13] M. GÜRDAL AND S. PEHLIVAN, *The statistical convergence in 2-Banach spaces*, Thai J. Math., **2**, (2004), 107–113.
- [14] M. GÜRDAL AND S. PEHLIVAN, *Statistical convergence in 2-normed spaces*, Southeast Asian Bull. Math., **33**, (2009), 257–264.
- [15] I. S. IBRAHIM, R. ÇOLAK, λ -statistically convergent and λ -statistically bounded sequences defined by modulus functions, Bol. Soc. Paran. Mat., **42**, (2014), 1–10.
- [16] U. KADAK AND F. BAŞAR, *Power series with real or fuzzy coefficients*, Filomat, **25**, no. 3 (2012), 519–528.
- [17] E. SAVAŞ AND R. F. PATTERSON, *Double sequence spaces defined by a modulus*, Math. Slovaca, **61**, (2011), 245–256.
- [18] E. SAVAŞ AND R. F. PATTERSON, (λ, η) -double sequence spaces via Orlicz function, J. Comput. Anal. Appl., **10**, no. 1 (2008), 101–111.

- [19] M. MURSALEEN AND F. BAŞAR, *Sequence Spaces: Topics in Modern Summability Theory*, CRC Press, Taylor & Francis Group, Series: Mathematics and Its Applications, Boca Raton, London, New York, 2020.
- [20] M. MURSALEEN AND O. H. H. EDELY, *On the invariant mean and statistical convergence*, Appl. Math. Lett., **22**, no. 11 (2009), 1700–1704.
- [21] D. RATH AND B. C. TRIPATHY, *On statistically convergent and statistical Cauchy sequences*, Indian J. Pure Appl. Math., **25**, no. 4 (1994), 381–386.
- [22] I. J. SCHOENBERG, *The integrability of certain functions and related summability methods*, Am. Math. Mon., **66**, (1959), 361–375.
- [23] Ö. TALO AND F. BAŞAR, *On the space $bv_p(F)$ of sequences of p -bounded variation of fuzzy numbers*, Acta Math. Sin. Engl. Ser., **24**, no. 7 (2008), 1205–1212.
- [24] Ö. TALO AND F. BAŞAR, *Certain spaces of sequences of fuzzy numbers defined by a modulus function*, Demonstratio Math., **43**, no. 1 (2010), 139–149.
- [25] Ö. TALO AND F. BAŞAR, *Quasilinearity of the classical sets of sequences of fuzzy numbers and some related results*, Taiwanese J. Math., **14**, no. 5 (2010), 1799–1819.
- [26] B. C. TRIPATHY AND M. SEN, *On generalized statistically convergent sequences*, Indian J. Pure Appl. Math., **32**, no. 11 (2001), 1689–1694.