

ON ALMOST STATISTICAL ρ -CONVERGENCE IN MODULAR SPACES

WOJCIECH M. KOZŁOWSKI AND FATIH NURAY*

Abstract. This paper extends the notion of almost statistical ρ -convergence from real or complex sequences to the elements of a modular space equipped with a convex modular. We investigate the relationship between almost statistical ρ -convergence, strong almost p -Cesàro ρ -summability, and the Δ_2 -type condition. Furthermore, we establish a Tauberian theorem for almost statistical ρ -convergence in this abstract setting.

Mathematics subject classification (2020): 40A35, 46A80, 40A05, 41A36.

Keywords and phrases: Almost convergence, statistical convergence, modular spaces, convex modular, Δ_2 -type condition, Tauberian theorem.

REFERENCES

- [1] J. S. CONNOR, *The statistical and strong p -Cesàro convergence of sequences*, Analysis **8** (1988), 47–64.
- [2] D. V. CRUZ-URIBE AND A. FIORENZA, *Variable Lebesgue Spaces: Foundations and Harmonic Analysis*, Birkhäuser, Basel, 2013.
- [3] H. FAST, *Sur la convergence statistique*, Colloq. Math. **2** (1951), 241–244.
- [4] J. A. FRIDY, *On statistical convergence*, Analysis **5** (1985), 301–313.
- [5] M. A. KHAMSI AND W. M. KOZŁOWSKI, *Fixed Point Theory in Modular Function Spaces*, Springer, Cham, 2015.
- [6] W. M. KOZŁOWSKI, *Modular Function Spaces*, Marcel Dekker, New York, 1988.
- [7] W. M. KOZŁOWSKI, *On modular approximants in sequential convergence spaces*, J. Approx. Theory **264** (2021), Article 105535.
- [8] W. M. KOZŁOWSKI, *Notes on modular projections*, Appl. Set-Valued Anal. Optim. **4** (2022), no. 3, 337–348.
- [9] W. M. KOZŁOWSKI, *Modular version of the Goebel–Kirk theorem*, Topol. Methods Nonlinear Anal. **63** (2024), no. 1, 99–114.
- [10] W. M. KOZŁOWSKI AND G. VINTI, *On approximation by rational functions in Musielak–Orlicz spaces*, J. Approx. Theory **304** (2024), Article 106083.
- [11] G. G. LORENTZ, *A contribution to the theory of divergent sequences*, Acta Math. **80** (1948), 167–190.
- [12] J. MUSIELAK, *Orlicz Spaces and Modular Spaces*, Lecture Notes in Math., Vol. 1034, Springer, Berlin, 1983.
- [13] H. NAKANO, *Modulated Semi-ordered Linear Spaces*, Maruzen, Tokyo, 1950.
- [14] F. NURAY, *On statistical convergence in modular vector spaces*, Acta Math. Univ. Comenianae **91** (2022), no. 4, 377–391.
- [15] T. SALÁT, *On statistically convergent sequences of real numbers*, Math. Slovaca **30** (1980), 139–150.
- [16] H. STEINHAUS, *Sur la convergence ordinaire et la convergence asymptotique*, Colloq. Math. **2** (1951), 73–74.