

HYPERCYCLICITY CRITERIA ON NON-ARCHIMEDEAN BANACH SPACES OF COUNTABLE TYPE

MOHAMMED BABAHMED

Abstract. In this paper we initiate the investigation of non-archimedean linear dynamics. We study the hypercyclicity in Non-archimedean setting. Then, we give some Hypercyclicity Criteria of operators on Non-archimedean Banach spaces of Countable Type.

Mathematics subject classification (2020): 47A16, 47S10, 47A99, 46B25.

Keywords and phrases: Hypercyclic operator, hypercyclicity criterion, non-archimedean Banach space of countable type.

REFERENCES

- [1] S. I. ANSARI, *Hypercyclic and cyclic vectors*, J. Funct. Anal. **128**, (1995), 374–383.
- [2] S. I. ANSARI, *Existence of hypercyclic operators on topological spaces*, J. Funct. Anal. **148**, (1997), 384–390.
- [3] F. BAYART, E. MATHERON, *Hypercyclic operators failing the hypercyclicity criterion on classical Banach Spaces*, J. Funct. Anal. **250**, (2007), 426–441.
- [4] F. BAYART, E. MATHERON, *Dynamics of linear operators*, Cambridge University Press 2009.
- [5] B. BEAUZAMY, *Un opérateur sur l'espace de Hilbert, dont tous les polynômes sont hypercycliques*, C.R.A.S Paris, Sér. I Math. **303**, (1986), 923–925.
- [6] B. BEAUZAMY, *An operator on a separable Hilbert space with many hypercyclic vectors*, Studia Math. **87**, (1987), 71–78.
- [7] B. BEAUZAMY, *Introduction to operator theory and invariant subspaces*, North-Holland, Amsterdam, (1988).
- [8] E. BECKENSTEIN, L. NARICI, *Functional analysis and valuation theory*, New York Dekker (1971).
- [9] L. BERNAL-GONZÁLEZ, *On hypercyclic operators on Banach spaces*, Proc. Amer. Math. Soc. **127**, (1999), 1003–1010.
- [10] J. BÉS, *Three problems on hypercyclic operators*, Ph.D Thesis, Kent state University (1988).
- [11] J. BÉS, A. PERIS, *Hereditary hypercyclic operators*, J. Funct. Anal. **167**, (1999), 94–112.
- [12] G. D. BIRKHOFF, *Démonstration d'un théorème élémentaire sur les fonctions entières*, C.R.A.S Paris **189**, (1929), 473–475.
- [13] J. BONET, A. PERIS, *Hypercyclic operators on non-normable Fréchet space*, J. Funct. Anal. **159**, (1998), 387–395.
- [14] M. DE LA ROSA, C. READ, *A hypercyclic operator whose direct sum $T \oplus T$ is not hypercyclic*, J. Operator Th. **61**, (2009), 369–380.
- [15] R. M. GETHNER, J. H. SHAPIRO, *Universal vectors for operators on spaces of holomorphic functions*, Proc. Amer. Math. Soc. **100**, (1987), 281–288.
- [16] K.-G. GROSSE-ERDMANN, A. PERIS, *Linear Chaos*, Springer, London, (2011).
- [17] O. KHAKIMOV, F. MUKHAMEDOV, *Hypercyclic and supercyclic linear operators on non-Archimedean vector spaces*, Bull. Belgian Math. Soc. **25** (1) (2018), 85–105.
- [18] C. KITAI, *Invariant closed sets for linear operators*, Thesis, University of Toronto, Toronto, (1982).
- [19] G. R. MACLANE, *Sequences of derivatives and normal families*, J. Anal. Math. **2**, (1952/53), 72–87.
- [20] A. F. MONNA, *Analyse Non-archimédienne*, Berlin Springer, (1970).
- [21] C. PEREZ-GARCIA, W. H. SCHIKHOF, *Locally convex spaces over non-archimedean valued fields*, Cambridge Studies in Advanced Mathematics **119**, (2010).

- [22] C. J. READ, *A solution to the invariant subspace problem*, Bull. London Math. Soc. **16**, (1984), 337–401.
- [23] C. J. READ, *The invariant subspace problem for a class of Banach spaces II. Hypercyclic operators*, Israel J. Math. **63**, (1988), 1–40.
- [24] A. M. ROBERT, *A course in p -adic analysis*, Berlin Springer, (2000).
- [25] S. ROLEWICZ, *On orbits of elements*, Studia Math. **32**, (1969), 17–22.
- [26] P. SCHNEIDER, *Non-archimedean functional analysis*, Berlin Springer, (2002).
- [27] H. N. SALAS, *Hypercyclic weighted shifts*, Trans. Amer. Math. Soc. **347**, (1995), 993–1004.
- [28] J. H. SHAPIRO, *Composition operators and classical function theory*, Springer, New York, (1993).
- [29] A. C. M. VAN ROOIJ, *Non-archimedean Functional analysis*, New York, Dekker, (1978).