Hypercyclic, Supercyclic Non-Archimedean Linear Operators

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Abstract

It is well known that linear dynamics began in the 1980's, where main problem of theory is to investigate the dynamical properties of a (bounded) linear operator T acting on some (complete) linear space. We notice that linear dynamics was first initiated by the study of the density of orbits, which lead to the notions of hypercyclicity, supercyclicity and their variants. We point out that the hypercyclicity of linear operators, as one of the most studied properties in linear dynamics, has become an active area of research. One of the interests of linear dynamics is started by examining certain examples of operators which have certain properties. Among these examples, the most studied class is certainly that of weighted shifts.

Last decades it has been published a lot of books devoted to the non-Archimedean functional analysis. Therefore, recently a non-archimedean shift operator has been investigated.

In the present talk, we are going to discuss some development in the theory of dynamics of linear operators defined on topological vector spaces. Furthermore, we are going to discuss hypercyclicity, supercyclicity of $I + B_{\mathbf{b}}$ on $c_0(\mathbb{N})$, where $B_{\mathbf{b}}$ is weighted unilateral shift. We notice that, in the real setting, the hyperbolicity of such types of operators on $\ell^2(\mathbb{N})$ (and other spaces) have been investigated. It was proved that $I + B_{\mathbf{b}}$ is hypercyclic if the weights are positive. We stress that, in the non-Archimedean setting, all ℓ^p-spaces coincide with c_0. Hence, we are going to establish the hypercyclicity of that operators on $c_0(\mathbb{N})$ depending on the weights. Our results are totally different from the real case.

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