46^{th} Annual Iranian Mathematics Conference
25-28 August 2015
Yazd University

On Subspace-hypercyclic Vectors

Mansooreh Moosapoor*
Farhangian University, Pardis Bentolhoda Sadr, Rasht, Iran.

Abstract

In this paper we state some properties of subspace-hypercyclic vectors. We show that if X be an F-space and M be a closed subspace of X, then for an operator T, the set $HC(T, M) \cap M$ is empty or dense in M.

Keywords: Hypercyclic vectors, Hypercyclic operators, Subspace-hypercyclic operators
Mathematics Subject Classification [2010]: 47A16, 47B37

1 Introduction

Let X be a Banach space. An operator T on X is hypercyclic, if there exists a vector $x \in X$ whose orbit under T, $orb(T, x) = \{x, Tx, T^2x, ...\}$, is dense in X. Such a vector x is called a hypercyclic vector for T.

Hypercyclic operators have been actively studied for more than twenty years. One can refer to [1] and [2] for more information about the subject.

Recently, B. F. Madore and R. A. Martinez-Avendano in [4] introduced the concept of subspace-hypercyclicity. One can see [3],[5] and [6] to find more results about subspace-hypercyclic operators.
Let us recall some preliminaries from [4].

Definition 1.1. Let $T \in B(X)$ and let M be a closed nonzero subspace of X. We say T is M-hypercyclic, if there exists $x \in X$ such that $orb(T, x) \cap M$ is dense in M. Such a vector x is called an M-hypercyclic vector for T.

We show the set of M-hypercyclic vectors of T by $HC(T, M)$.

Definition 1.2. Let $T \in B(X)$. We say T is M-transitive, if for any non-empty open sets $U \subseteq M$ and $V \subseteq M$, both relatively open, there exists $n \in N_0$ such that $T^{-n}(U) \cap V$ contains a relatively open non-empty subset of M.

The following lemma states two equivalent conditions for subspace-transitivity.

Lemma 1.3. *Let $T \in B(X)$. The following conditions are equivalent:*

*Speaker