



Some Sufficient Conditions for Subspace-hypercyclicity

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Abstract

In this paper we state some sufficient conditions for an operator to be subspace-hypercyclic. We also Costruct some interesting examples of subspace-hypercyclic operators with special properties.

Keywords: Subspace-hypercyclic operators, Subspace-mixing operators, Subspace-transitive operators.

Mathematics Subject Classification [2010]: 47A16, 47B37

1 Introduction

Recently Madore and Martinez-Avendano in [3] introduced the concept of subspace-hypercyclicity for an operator as follows:

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

Definition 1.2. Let $T \in B(X)$ and let M be a closed subspace of X . We say that T is M -transitive, if for any non-empty open sets $U \subseteq M$ and $V \subseteq M$, there exists $n \in \mathbb{N}_0$ such that $T^{-n}(U) \cap V$ contains a relatively open nonempty subset of M .

Theorem 1.3. ([3]) Let $T \in B(X)$ and let M be a nonzero closed subspace of X . If T is M -transitive, then T is M -hypercyclic.

It is proved in [3] by Madore and Martinez-Avendano that the converse of Theorem 1.3 is not always true. So there are subspace-hypercyclic operators that are not subspace-transitive.

In [1], [2] and [5] one can find more results about subspace-hypercyclic operators.

In this paper we state some sufficient conditions for an operator to be subspace-hypercyclic. Also we construct various examples of subspace-hypercyclic operators by using these conditions.

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