

A NEW METHOD FOR NON-SUPERCYCLICITY

FERNANDO LEÓN-SAAVEDRA

ABSTRACT. A bounded linear operator T defined on a Banach space X is said to be supercyclic if there exists $x \in X$ such that $\{\lambda T^n x : n \in \mathbb{N}, \lambda \in \mathbb{C}\}$ is dense in X , and it is called weakly supercyclic if the above set is weakly dense in X . The interest in the study of different types of operator orbits arises from the invariant subspace problem. To prove non-supercyclicity usually is very complicated. Our results assert that under certain conditions supercyclicity is equivalent to positive supercyclicity: Namely, we can multiply $T^n x$ only by positive real numbers. As a consequence we obtain a new approach to the invariant subspace problem in the positive direction. Moreover, we provide a new technique to provide non-supercyclicity, even non weakly-supercyclicity. This method applies to a large class in the commutant of the classical Volterra operator is not weakly supercyclic, the infinite Cesàro operator, etc. The size of the commutant of T will be important in the discussion.