İSTANBUL ANALYSIS SEMINARS

EXTENDING FAMILIES OF DISJOINT HYPERCYCLIC OPERATORS

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Abstract: An operator T on a Banach space X is *hypercyclic* (respectively, *supercyclic*) if there exists a vector x in X for which its orbit $\mathrm{Orb}(T, x) = \{T^n x : n \geq 0\}$ (respectively, the projective orbit $\mathbb{C} \cdot \mathrm{Orb}(T, x) = \{\lambda T^n x : n \geq 0 \text{ and } \lambda \in \mathbb{C}\}$) is dense in X. In 2007, Bès and Peris, and Bernal-González independently introduced the concept of disjoint hypercyclicity. We say two or more linear operators $T_1, \ldots, T_N$ are *disjoint hypercyclic* (respectively, *disjoint supercyclic*) if there exists a vector x in X for which the direct sum $T_1 \oplus \cdots \oplus T_N$ has a hypercyclic (respectively, supercyclic) vector in the form $(x, \ldots, x) \in X^N$.

In the class of weighted shift operators, we partially answer a question of Salas asking if given a finite collection $T_1, \ldots, T_N$ of disjoint hypercyclic (supercyclic) operators, can one find an additional operator T_{N+1} for which the larger family $T_1, \ldots, T_N, T_{N+1}$ remains disjoint hypercyclic (supercyclic). To this end, we first characterize disjoint hypercyclic and supercyclic weighted shifts in terms of their weight sequences.

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