

İSTANBUL ANALYSIS SEMINARS

LINEAR CHAOS AND FREQUENT HYPERCYCLICITY

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Abstract: Let T be a continuous and linear operator on a Banach space X . We say that T is hypercyclic if there is some vector $x \in X$ whose orbit visits (infinitely often) each non-empty open set $U \subset X$. During the last decade, the researchers in Linear Dynamics have investigated the frequency of these visits and several variants of the notion of hypercyclicity have been introduced: the frequent hypercyclicity [1, 2], the \mathcal{U} -frequent hypercyclicity [3] and the reiterative hypercyclicity [4].

The goal of this talk is to investigate the links between these different notions of hypercyclicity and their link with linear chaos. In particular, we answer one of the main current questions in Linear Dynamics by showing that there exists a chaotic operator on ℓ^1 which is not frequently hypercyclic [5].

References

- [1] F. Bayart & S. Grivaux, “Hypercyclicité : le rôle du spectre ponctuel unimodulaire,” *C. R. Math. Acad. Sci. Paris* **338** (2004), no. 9, 703–708.
- [2] F. Bayart & S. Grivaux, “Frequently hypercyclic operators,” *Trans. Amer. Math. Soc.* **358** (2006), no. 11, 5083–5117.
- [3] S. Shkarin, “On the spectrum of frequently hypercyclic operators,” *Proc. Amer. Math. Soc.* **137** (2009), no. 1, 123–134.
- [4] J. Bès, Q. Menet, A. Peris & Y. Puig, “Recurrence properties of hypercyclic operators,” arXiv: 1410.1349 [math.FA] (2014).
- [5] Q. Menet, “Linear chaos and frequent hypercyclicity,” arXiv: 1410.7173 [math.DS] (2014).

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