

Recurrence and Primitivity for IP Systems with Polynomial Wildcards

James Campbell

Abstract

We present a formulation of our recent generalization of the 1985 IP Szemerédi theorem of Furstenberg and Katznelson (Theorem FK). We review that (unjustly neglected) theorem, then give the statement of our theorem. Of central importance is the existence of a certain class of Hilbert space projections. We will carefully describe how to obtain these projections, and indicate how they establish a related single-recurrence result. Our main theorem may be paraphrased as this: The set α in Theorem FK may be constrained to have cardinality taken from the range of any polynomial with integer coefficients and zero constant term, e.g., $|\alpha| = n^2$, for some integer n . Moreover, n may be restricted to the range of any specified IP-set. Joint work with Randall McCutcheon, which will appear in the Transactions of the A.M.S.