1011-20-74 **Adam Piggott*** (adam.piggott@lycos.co.uk), Department of Mathematics, 503 Boston Avenue, Medford Campus, Tufts University, Medford, MA 02155. *Detecting the growth of free-group automorphisms via their action on homology.*

The growth of an automorphism is a function which quantifies the rate at which the image of a fixed set of generators changes under iteration. It is immediate from results by Bestvina, Feighn and Handel that the growth of an element of $\mathrm{Aut}(\mathrm{F}_n)$ is either exponential, or polynomial of integer degree at most n-1. In general, of course, the growth of an automorphism $\phi \in \mathrm{Aut}(\mathrm{F}_n)$ and the growth of the induced automorphism ϕ_{ab} of the free abelian group of rank n are not equivalent. We present the following:

Theorem: Let $\phi \in \mathrm{Aut}(\mathrm{F}_n)$ be an automorphism with polynomial growth. There exists a characteristic finite-index subgroup $S \leq \mathrm{F}_n$ such that the growth of ϕ, $\phi|_S$ and $(\phi|_S)_{\mathrm{ab}}$ are equivalent.

The proof is constructive, and geometric in nature. The tools used are Stallings' folding operation, and the train track technology of Bestvina, Feighn and Handel. (Received August 13, 2005)