1081-20-106 **Brian Ray*** (ray8@illinois.edu), 1409 W. Green St., Urbana, IL 61801. *Non-Rigidity of Cyclic Automorphic Orbits in Free Groups.*

We say a subset $\Sigma \subseteq F_N$ of the free group of rank N is *spectrally rigid* if whenever $T_1, T_2 \in \mathrm{cv}_N$ are $\mathbb{R}$-trees in (unprojectivized) outer space for which $\|\sigma\|_{T_1} = \|\sigma\|_{T_2}$ for every $\sigma \in \Sigma$, then $T_1 = T_2$ in cv_N. Recent results by Carette, Francaviglia, Kapovich, and Martino motivate the following question: is it true that for any $H \leq \mathrm{Aut}(F_N)$ either for every $1 \neq g \in F_N$, the orbit Hg is rigid or for every $1 \neq g \in F_N$, the orbit Hg is not rigid? We will explain why, in the case H is cyclic, the orbit Hg is never rigid. (Received February 03, 2012)