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**Colin Defant** and **Michael Joseph\*** (mjoseph@daltonstate.edu), 650 College Dr., Dalton, GA 30720, and **Matthew Macauley** and **Alex McDonough**. *Toggling Independent Sets of a Cycle Graph*.

In recent years, actions in toggle groups have been of interest in dynamical algebraic combinatorics due to various phenomena including periodicity, cyclic sieving, and homomesy. Given a set  $E$  and a set  $\mathcal{L} \subseteq 2^E$  of allowed subsets, there is a toggle  $\tau_e : \mathcal{L} \rightarrow \mathcal{L}$  for each  $e \in E$ . Given  $X \in \mathcal{L}$ , the toggle  $\tau_e$  adds or removes  $e$  from  $X$  provided the resulting set is still in  $\mathcal{L}$ , and otherwise does nothing. The presenter (with Tom Roby) previously studied an action which is a composition of toggles over independent sets of path graphs, proving that a sum vector is palindromic over every orbit. This work is about a similar action on independent sets of cycle graphs instead. While the first mystery that caught our interest was the observation that the sum vector in every orbit is periodic with an odd period, our exploration of this dynamical system led us to find a group structure on the “live” entries of each orbit. (Received September 21, 2021)