1125-05-726 **Ashvin Anand Swaminathan*** (`aaswaminathan@college.harvard.edu`), 388 Eliot Mail Center, 101 Dunster Street, Cambridge, MA 02138, and **Noam D Elkies** (`elkies@math.harvard.edu`), 1 Oxford Street, Cambridge, MA 02138. *Permutations that Destroy Arithmetic Progressions in Elementary p-groups.*

Given an abelian group G, it is natural to ask whether there exists a permutation π of G that "destroys" all nontrivial 3-term arithmetic progressions (APs), in the sense that $\pi(b) - \pi(a) \neq \pi(c) - \pi(b)$ for every ordered triple $(a, b, c) \in G^3$ satisfying $b - a = c - b \neq 0$. This question was resolved for infinite groups G by Hegarty, who showed that there exists an AP-destroying permutation of G if and only if $G/\Omega_2(G)$ has the same cardinality as G, where $\Omega_2(G)$ denotes the subgroup of all elements in G whose order divides 2. In the case when G is finite, however, only partial results have been obtained thus far. Hegarty has conjectured that an AP-destroying permutation of G exists if $G = \mathbb{Z}/n\mathbb{Z}$ for all $n \neq 2, 3, 5, 7$, and together with Martinsson, he has proven the conjecture for all $n > 1.4 \times 10^{14}$. In this paper, we show that if p is a prime and k is a positive integer, then there is an AP-destroying permutation of the elementary p-group $(\mathbb{Z}/p\mathbb{Z})^k$ if and only if p is odd and $(p, k) \notin \{(3, 1), (5, 1), (7, 1)\}$. (Received September 09, 2016)