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**Caroline Terry\***, Department of Mathematics, The University of Chicago, 5734 S. University Avenue, Chicago, IL 60637, and **Julia Wolf**, Department of Pure Mathematics, Centre for Mathematics Sciences, Wilberforce Road, Cambridge, CB3 0WB, United Kingdom. *A stable arithmetic regularity lemma in finite abelian groups.*

The arithmetic regularity lemma for  $\mathbb{F}_p^n$  (first proved by Green in 2005) states that given  $A \subseteq \mathbb{F}_p^n$ , there exists  $H \leq \mathbb{F}_p^n$  of bounded index such that  $A$  is Fourier-uniform with respect to almost all cosets of  $H$ . In general, the growth of the index of  $H$  is required to be of tower type depending on the degree of uniformity, and must also allow for a small number of non-uniform elements. Previously, in joint work with Wolf, we showed that under a natural stability theoretic assumption, the bad bounds and non-uniform elements are not necessary. In this talk, we present results extending these results to stable subsets of arbitrary finite abelian groups. This is joint work with Julia Wolf. (Received September 22, 2018)