ZERO SUM SUBSEQUENCES OF SHORT LENGTH WITH WEIGHTS

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ABSTRACT. Let G be an additive finite abelian group with exponent m and A is a non-empty finite subset of integers. The constant $\eta_A(G)$ is the smallest positive integer t such that any sequence of length t of elements of G contains a non-empty A-weighted zero sum subsequence of length at most $\exp(G)$. The constant $s_A(G)$ is the smallest positive integer t such that any sequence of length t of elements of G contains an A-weighted zero sum subsequence of length $\exp(G)$. We shall be dealing with the case $A = \{1, -1\}$. In this case, we shall replace $s_A(G)$ and $\eta_A(G)$ by $s_\pm(G)$ and $\eta_\pm(G)$ respectively.

In this note we shall calculate the value of $\eta_\pm(G)$ for certain abelian groups G of rank 2 and 3. And we shall check validity of a weighted version of conjecture of W. Gao, $s_\pm(G) = \eta_\pm(G) + \exp(G) - 1$, for few finite abelian groups G. Also, we shall give the example of groups for which above relation does not hold true. All proofs are based on mainly counting arguments.