1052-11-280 **Y.-R. Liu**, **C. V. Spencer** and **X. Zhao*** (x8zhao@math.uwaterloo.ca), Department of Pure Mathematics, Faculty of Mathematics, University of Waterloo, Waterloo, Ontario N2L 3G1, Canada. *A generalization of Meshulam's theorem on subsets of finite abelian groups with no 3-term arithmetic progression.*

Let $G \simeq \mathbb{Z}/k_1\mathbb{Z} \oplus \cdots \oplus \mathbb{Z}/k_N\mathbb{Z}$ be a finite abelian group with $k_i | k_{i-1}\,(2 \leq i \leq N)$. For a matrix $Y = \left(a_{i,j}\right) \in \mathbb{Z}^{R \times S}$ satisfying $a_{i,1} + \cdots + a_{i,S} = 0$ $(1 \leq i \leq R)$, let $D_Y(G)$ denote the maximal cardinality of a set $A \subseteq G$ for which the equations $a_{i,1}x_1 + \cdots + a_{i,S}x_S = 0$ $(1 \leq i \leq R)$ are never satisfied simultaneously by distinct elements $x_1, \ldots, x_S \in A$. Under certain assumptions on Y and G, we prove an upper bound of the form $D_Y(G) \leq C|G|/N^{\gamma}$ for positive constants C and γ. (Received August 30, 2009)