1067-11-1094 **Krishanu Roy Sankar*** (`sankark1991@gmail.com`), 4 Saunders Street, Hastings on Hudson, NY 10706. *On Nathanson's problem in number theory and geometric group theory.*

Call $K \subset \mathbb{R}^n$ an $\mathcal{N}$-set if K is compact and $K + \mathbb{Z}^n = \mathbb{R}^n$. Nathanson asked which subsets $A \subset \mathbb{Z}^n$ can be written in the form $(K - K) \cap \mathbb{Z}^n$ for K an $\mathcal{N}$-set. It is known that A must generate $\mathbb{Z}^n$, and that this condition is sufficient in one dimension, but not much else is known other than that it is not sufficient in two dimensions. We partially address this question. First, we can define a notion of 'connectedness' between nonzero elements of $A \subset \mathbb{Z}^n$: if the sum or difference of two nonzero elements of A is in A, we call them connected. We show that if A can be written in the desired form, then some connected component of A can be as well. We explore various generalizations of this theorem, the problem itself, and the methods used. Some conjectures and open questions are discussed. (Received September 18, 2010)