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Ryan W Matzke* (matzry01@gettysburg.edu). *Subtraction Adds Nothing: The Minimum Sized h -fold Span of m -sized Subsets of Cyclic Groups*. Preliminary report.

Let G be a finite cyclic group written with additive notation. For a positive integer h and a nonempty subset A of G , we let hA and $h_{\pm}A$ denote the h -fold unrestricted sumset of A and the h -fold unrestricted span of A , respectively; that is, hA is the collection of sums of h not-necessarily-distinct elements of A , and $h_{\pm}A$ consists of all signed sums of h not-necessarily-distinct elements, meaning you can add or subtract each element rather than only add. For a positive $m \leq |G|$, we let

$$\rho(\mathbb{Z}_n, m, h) = \min\{|hA| : A \subseteq G, |A| = m\}$$

and

$$\rho_{\pm}(\mathbb{Z}_n, m, h) = \min\{|h_{\pm}A| : A \subseteq G, |A| = m\}.$$

While one might intuitively think that $\rho(\mathbb{Z}_n, m, h)$ would tend to be smaller, we find that the two are always equal. (Received September 17, 2013)