Unique representation systems

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Let G be a structure with addition defined on it. If $S, A, B \subset G$ then $\{A, B\}$ is a *unique representation system* for S if $S = A + B$ and every element of S has a unique representation as $a + b$ where $a \in A, b \in B$ (see for example [2]). We write $S = A \bigoplus B$. Instead of two sets A and B we can consider a family $\mathcal{A} = (A_i)_{i \in I}$ of sets and require that we choose a 0 from all but a finite number of sets A_i for the representation. We write $S = \bigoplus_{i \in I} A_i$. We classify unique representation systems for S being the set of non-negative integers under addition (in this special case called *additive systems*) — the two-set case was done in [1] and the general case in [2].

References

[1] F. Benevides, J. Hulgan, N. Lemons, C. Palmer, A. Riet, J. Wheeler, Additive properties of a pair of sequences, *Acta Arith.* 139 (2009), no. 2, 185–197.

[2] M. Nathanson, Additive systems and a theorem of de Bruijn, *arXiv:* 1301.6208v2, 12 Apr 2013.