

## On partitions of $\mathbb{Z}_m$ with the same representation function

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**Abstract.** For any positive integer  $m$ , let  $\mathbb{Z}_m$  be the set of residue classes modulo  $m$ . For  $A \subseteq \mathbb{Z}_m$  and  $\bar{n} \in \mathbb{Z}_m$ , let  $R_A(\bar{n})$  denote the number of solutions of  $\bar{n} = \bar{a} + \bar{a}'$  with unordered pairs  $(\bar{a}, \bar{a}') \in A \times A$ . In this paper, we prove that if  $m = 2^\alpha$  with  $\alpha \neq 2$ ,  $A \cup B = \mathbb{Z}_m$  and  $|A \cap B| = 2$ , then  $R_A(\bar{n}) = R_B(\bar{n})$  for all  $\bar{n} \in \mathbb{Z}_m$  if and only if  $B = A + \frac{m}{2}$ .

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