Split-S-Nim

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Split-S-Nim is a variant of Nim where S is a subset of the integers. On a player's turn, the player may remove a non-zero number of coins from a pile or, given $s \in S$, replace a pile of height n with two smaller piles with a total $n + s$ coins. We consider sets of only even integers with a minimum element of the form 2^k or $2^k + 2$ and find the Grundy numbers for the normal play version of the game, along with the game where $S = \mathbb{Z}$.