Magic squares with empty cells

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A k-magic square of order n is an arrangement of the numbers from 0 to $kn-1$ in an $n \times n$ matrix, such that each row and each column has exactly k filled cells, each number occurs exactly once, and the sum of the entries of any row or any column is the same. A magic square is called k-diagonal if its entries all belong to k consecutive diagonals. In this talk we show that a k-diagonal magic square exists if and only if $n = k = 1$ or $3 \leq k \leq n$ and n is odd or k is even.