

Pandiagonal Multimagic Squares Based on Large Sets of Orthogonal Arrays

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Large sets of orthogonal arrays (LOA) have been used to construct resilient functions and zigzag functions by D. R. Stinson. In this paper, a construction of pandiagonal t -multimagic squares of order n ($\text{PMS}(n, t)$) based on a special kind of LOA called quadruple LOA is presented. As its application, it is shown that there exists a $\text{PMS}(q^{2t}, t)$ for all odd prime power $q \geq 4t - 1$ with $t \geq 2$, which provides an improvement of previous results.

Keywords: multimagic squares, large set, orthogonal arrays, pandiagonal