THE COMPRESSED SHAPE OF A PARTIAL LATIN RECTANGLE.

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ABSTRACT. Gröbner bases have recently been used in order to determine the number of partial Latin squares of order $n \leq 4$. However, for higher orders, the method which has been used requires to solve problems related to time of computation and storage memory. In the current paper, we propose to improve it by considering polynomials related to the different row and column types in which can be classified the set of partial Latin rectangles of a given order. In particular, we use Gröbner bases to determine the set of $(0,1)$-matrices with a given row and column sum vectors. As an application, we have classified the set of possible shapes, up to row and column permutation, of the set of $k \times n$ partial Latin rectangles, for any $k, n \leq 5$.

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