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ON THE MINIMUM VALUES AND MONOTONICITY OF PERMANENT FUNCTIONS

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In this dissertation, we investigate the minimum permanents on certain faces of the polytope of doubly stochastic matrices, and the monotonicity of permanent functions.

In section 2, we consider the face of the polytope of $(m+3)$-square doubly stochastic matrices which contain diagonal matrix of order 3. We determine the minimum permanents and find the minimizing matrices on the given faces. And we show that a given matrix is cohesive but not barycentric.

In section 3, we consider the faces of the polytope of $(2+n)$-square doubly stochastic matrices which contain diagonal matrix of order n. We determine the (local) minimum permanents at their barycenters for each n.

In section 4, we have a condition on the boundary of the face for the derangement matrix. This condition implies monotonicity of a permanent function on the given face and gives a partial solution for a non-solved conjecture for the derangement matrix.

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