Abstract

We consider the convex hull of the even permutations on a set of n elements. We define a class of valid inequalities and prove that they induce a large class of distinct facets of the polytope. Using the inequalities, we characterize the polytope for $n = 4$, and we confirm a conjecture of Brualdi and Liu that, unlike the convex hull of all permutations, this polytope cannot be described as the solution set of polynomially many linear inequalities. We also discuss the difficulty of determining whether a given point is in the polytope.