**Abstract**

We study the Lovász-Schrijver lift-and-project procedure $N_+$ on the linear relaxation of the Dantzig-Fulkerson-Johnson formulation of the TSP. We show that the $N_+$-rank of 2-matching inequalities relative to this relaxation can be arbitrarily high. We obtain as a corollary that the integrality gap of a family of linear relaxations for metric TSP is at least $\frac{4}{3}$.