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When does the Positive Semidefiniteness Constraint Help in Lifting Procedures

Michel X. Goemans* & Levent Tunçel

Abstract We study the lift-and-project procedures of Lovász and Schrijver for $0 - 1$ integer programming problems. We prove that the procedure using the positive semidefiniteness constraint is not better than the one without it, in the worst case. Various examples are considered. We also provide geometric conditions characterizing when the positive semidefiniteness constraint does not help.