

Pruning by Isomorphism in Branch-and-Cut

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Abstract

The paper presents a Branch-and-Cut for solving $(0, 1)$ integer linear programs having a large symmetry group. The group is used for pruning the enumeration tree and for generating cuts. The cuts are non standard, cutting integer feasible solutions but leaving unchanged the optimal value of the problem. Pruning and cut generation are performed by backtracking procedures using a Schreier-Sims table for representing the group. Applications to the generation of covering designs and error correcting codes are presented.