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*Facial reduction for symmetry reduced semidefinite programs*

We consider both facial and symmetry reduction techniques for semidefinite programming, SDP. We show that the two together fits surprisingly well with an alternating direction method of multipliers, ADMM. The combination of facial and symmetry reduction leads to a significant improvement in both numerical stability and running time for both the ADMM and interior point approaches. We test our method on various relaxations of hard combinatorial problems. This is a joint work with Renata Sotirov and Henry Wolkowicz.