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On the Finite Convergence of Successive SDP Relaxation Methods

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Abstract Let F be a subset of the n-dimensional Euclidean space R^n represented in terms of a compact convex subset C_0 and a set $\mathcal{P}_F$ of finitely or infinitely many quadratic functions on R^n such that

$$F = \{x \in C_0 : p(x) \leq 0 (\forall p(\cdot) \in \mathcal{P}_F)\}.$$

In this paper, we investigate some fundamental properties related to the finite convergence of the successive SDP (semidefinite programming) relaxation method proposed by the authors for approximating the convex hull of F.

Keywords Nonconvex Quadratic Program, Finite Convergence, Complexity, Semidefinite Programming, Global Optimization, SDP Relaxation, Convex Relaxation, Lift-and-Project Procedure.