

**Mathematical programs with complementarity constraints:
Optimality conditions, generic properties and
a parametric approach**

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Abstract: Optimization problems P with complementarity constraints are considered. We firstly deal with sufficient and necessary optimality conditions for minimizers \bar{x} of P of order one and two. We review general genericity properties of the problems. Then we analyze a parametric smoothing approach to solve these programs in which the problem P is replaced by a perturbed problem P_τ depending on a (small) parameter τ . We are interested in the convergence behavior of the feasible set F_τ and the solution \bar{x}_τ of P_τ for $\tau \rightarrow 0$. It is shown, that under generic assumptions the error $\|\bar{x}_\tau - \bar{x}\|$ converges with a rate $\mathcal{O}(\sqrt{\tau})$.

Keywords: mathematical programs with complementarity constraints, interior point method, order of a minimizer, genericity.

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