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On sequential second-order optimality conditions, constraint qualifications and applications to mathematical programming

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Resumo

Sequential optimality conditions provide adequate theoretical tools to justify stopping criteria for nonlinear programming solvers. Most of them use only first-order information. In this paper we will introduce new sequential optimality conditions that take into account first and second-order information. We will prove that well-established algorithms with convergence to second-order stationary points produce sequences whose limit satisfies these new conditions. We also associate new constraint qualifications to these sequential second-order optimality conditions. Relationship with the weak second-order necessary condition and second-order constraint qualifications are analyzed. Practical consequences will be discussed.