

# Two new optimality conditions for nonlinear symmetric cone programming

Gabriel Haeser<sup>1</sup>

<sup>1</sup> IMS-USP

Nonlinear symmetric cone programming (NSCP) generalizes important optimization problems such as nonlinear programming (NLP), nonlinear semidefinite programming (NSDP) and nonlinear second-order cone programming (NSOCP). In this work, we present two new optimality conditions for NSCP without constraint qualifications, which implies the Karush-Kuhn-Tucker (KKT) conditions under a condition weaker than Robinson's constraint qualification. In addition, we prove that an augmented Lagrangian method proposed for NSOCPs satisfies our optimality conditions, which gives better global convergence results.