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A VARIANT OF THE AFFINE-SCALING METHOD FOR A CONE PROGRAMMING PROBLEM ON A SECOND-ORDER CONE

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A linear cone programming problem in which the cone is the direct product of second-order cones (Lorentz cones) is considered. For its solution we propose a direct affine-scaling type method generalizing the corresponding method used in linear programming. The method can be considered as a special way to solve a system of necessary and sufficient optimality conditions for a pair of mutually dual cone programming problems. These conditions are used to derive the dependence of the dual variables on the primal variables, and the dependence is substituted into the complementarity condition. The obtained system of equations is solved with respect to the primal variables by the simple iteration method. The starting points in the method belong to the cone but do not necessarily satisfy the linear equality-type constraints. The local linear convergence of the method is proved under the assumption that the solutions of the primal and dual problems are nondegenerate and strictly complementary.

Keywords: cone programming, second-order cone, affine-scaling method, local convergence.

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