A globally convergent sequential linear programming algorithm for mathematical programs with linear complementarity constraints*

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Abstract

This paper presents a sequential linear programming algorithm for computing a stationary point of a mathematical program with linear equilibrium constraints. The algorithm is based on a formulation of equilibrium constraints as a system of semi smooth equations by means of a perturbed Fischer-Burmeister functional. Using only data of the problem, we introduce a new method to update the parameter that characterizes the aforesaid perturbed functional. With the aim of avoiding the need to choose penalty parameters, we introduce a simple restoration step. Some computational results are reported.

Keywords : *Mathematical program with equilibrium constraints, linear parametric complementarity problem, Fischer-Burmeister functional, sequential linear programming algorithm, restoration step.*

1. Introduction

A *mathematical program with equilibrium constraint* (MPEC) is an optimization problem whose constraints include variational inequalities or complementarity system parameterized by a design variable. Equilibrium constraints in the form of complementarity conditions, and more generally variational inequalities, often appear as constraints in optimization problems. Applications of equilibrium constraints are widespread and fast growing. They cover very diverse areas such as the design of structures involving friction, elasto-hydrodynamic lubrication, taxation models, the modeling of competition in deregulated electricity markets

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