L-infinity norm solution of an under-determined system

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ABSTRACT.

We propose a new algorithm for the solution of minimum infinity solution of under-determined linear systems. It is a primal method like the one exists in the current literature [1, 2, 3, 4] but it is decidedly more in the spirit of a dual method. It is geometrically and conceptually clear and provides important new insight into the nature of the problem. The method is premised on the observation that at minimum there are at least n - (m -1) elements equal in absolute value and that these elements are maximal. The algorithm is thus logically divided into two parts; firstly a solution with n - (m - 1) elements equal is absolute value and maximal is obtained, and secondly the location of those elements is changed in such a way as to reduce the infinity norm at each step. Theoretical convergence proof is given.

KEY WORDS: Path following algorithm, Directed acyclic graph, primal formulation, Index set, Line search procedure

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