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Design, analysis and performance evaluation of parallel algorithms for solving triangular linear systems on multicore platforms. (English) Zbl 07373727
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Summary: In this paper, we focus on the schedulings of 2-steps graph with constant task cost obtained when parallelizing algorithm solving a triangular linear system. We present three scheduling approaches having the same least theoretical execution time. The first is designed through solving a 0-1 integer problem by Mixed Integer Programming (MIP), the second is based on the Critical Path Algorithm (CPA) and the third is a particular Column-Oriented Scheduling (COS). The MIP approach experiments were carried out and confirmed that the makespan values of the MIP scheduling coincide with those of the corresponding lower bound already reached. Experimental results of the last two approaches detailing both makespans and efficiencies are presented and show that their practical performances differ though they are theoretically identical. We compare also these results to those of the appropriate procedure into so-called PLASMA library (Parallel Linear Algebra for Scalable Multi-core Architectures).

MSC:
90C10 Integer programming
68M20 Performance evaluation, queueing, and scheduling in the context of computer systems
65F05 Direct numerical methods for linear systems and matrix inversion

Keywords:
0-1 integer problem; task scheduling; parallel algorithm; PLASMA library; triangular linear system

Full Text: DOI

References:
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