

1116-90-2001

Robert Lion Gottwald, Courtney Y. Kempton, David Y. Leffler and Li Qian*
(li.qian14@myhunter.cuny.edu). *Problem Specific Primal Heuristics for Supply Chain Management in a General MIP Solving Framework*. Preliminary report.

Supply chain management (SCM) is the management of the flow of goods and products through a network consisting of transportation and production. Due to the vast number of integral variables involved in the mixed-integer programming formulations of SCM, even state-of-the-art mixed-integer programming (MIP) solvers often fail to find good solutions within a reasonable amount of time. We propose three new primal heuristics aimed at utilizing the SCM-specific problem structure to improve the solving process of SCM problems. The methods were developed and tested within SCIP (a MIP solver developed at Zuse Institute Berlin) on four different categories of test instances representing real-world SCM problems. In addition to the development of these heuristics we test the correlation of a large set of features with solution quality. In our computational experiments, two of the new heuristics, Strong Rounding and Time-Horizon Sub-MIP, were able to improve the primal integral on the majority of our test instances. Furthermore, our analysis of solution features found the median of delivered demand rate per material to be a good indicator of solution quality. (Received September 21, 2015)