
Efficient routes in a Periodic Inventory Routing Problem

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Abstract

In this work, a mixed-integer linear programming formulation for a Periodic Inventory Routing Problem, based on routes variables, is presented. In particular, a product has to be shipped from a supplier to a set of customers over an infinite time horizon. Given the plan periodicity, the problem is to determine a periodic shipping policy that minimizes the sum of transportation and inventory costs at the supplier and at the customers per time unit. Due to the difficulty to solve a formulation with all the possible feasible routes, the aim of this work is to find the minimal set of routes that allows to have the best possible worst-case performance ratio, allowing to solve the problem with a lower number of integer variables ensuring the quality of the solution over a threshold.

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