

SEMINÁRIO

Investigação Operacional

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Mixed-Integer Linear Programming Models for the Scheduling of Multiproduct Pipeline Systems

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Abstract:

Pipelines are the safest and least expensive way for the long-distance transportation of various refined products. For a given pipeline system, the quality of the schedule reflects the level of management and facility utilization, strongly affecting its profit as well as its safety. However, the optimization of multiproduct pipeline systems is a very complex task with many different types of constraints (supply and demand, topological structures, transport operations, equipment, contamination, etc.) to be considered. It may be challenging to find the optimal schedule or even a feasible schedule that meets all the operation constraints. To address such big challenges facing the pipeline company, this presentation introduces three computationally efficient MILP models for the detailed scheduling of multiproduct pipeline systems, ranging from straight pipelines to branched networks to mesh networks. The main novelty of our work is to allow multiple injections/deliveries during a slot while keeping the models linear and accurate. It helps to reduce the required number of slots and improve computational performance significantly. Twelve benchmark problems from the literature involving different pipeline configurations are solved to show our superiority in solution quality and computational time.