

Mixed Integer Models for the Optimization of Gas Networks

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Abstract: A gas network basically consists of a set of compressors and valves that are connected by pipes. The task of the transient technical optimization is to optimize the drives of the gas and to set in the compressors cost-efficiently such that the required demands are satisfied. This problem leads to a complex mixed integer nonlinear optimization problem. We approach it by approximating the non-linearities by piece-wise linear functions leading to a huge mixed integer program. We study the polyhedral consequences of this model and present some new cutting planes. Our preliminary computational results show the benefits when incorporating these cuts into a general mixed integer programming solver.

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