

## **A Relax-and-Cut Framework for Gomory's Mixed-Integer Cuts**

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Gomory's Mixed-Integer Cuts (GMICs) are widely used in modern branch-and-cut codes for the solution of Mixed-Integer Programs. Typically, GMICs are iteratively generated from the optimal basis of the current Linear Programming (LP) relaxation, and immediately added to the LP before the next round of cuts is generated. Unfortunately, this approach is prone to instability.

In this talk we analyze a different scheme for the generation of rank-1 GMIC read from a basis of the original LP, the one before the addition of any cut. We adopt a relax-and-cut approach where the generated GMIC are not added to the current LP, but immediately relaxed in a Lagrangian fashion.

Various elaborations of the basic idea are presented, that lead to very fast—yet accurate—variants of the basic scheme. Very encouraging computational results are presented, with a comparison with alternative techniques from the literature also aimed at improving the GMIC quality. We also show how our method can be integrated with other cut generators, and successfully used in a cut-and-branch enumerative framework.

This is joint work with Matteo Fischetti.