

# On the Independent Dominating Set Polytope

J. Mailfert<sup>1</sup> and A.R. Mahjoub<sup>2</sup>

1. LIMOS, CNRS UMR 6158, Université Blaise Pascal Clermont II, Complexe Scientifique des  
Cézeaux, 63177 Aubière Cedex, France  
*mailfert@isima.fr*

2. LIMOS, CNRS UMR 6158, Université Blaise Pascal Clermont II, Complexe Scientifique des  
Cézeaux, 63177 Aubière Cedex, France  
*Ridha.Mahjoub@math.univ-bpclermont.fr*

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## Abstract

In this paper, we consider the independent dominating set polytope. We give a complete linear description of that polytope when the graph is reduced to a cycle. This description uses a general class of valid inequalities introduced in [?]. We devise a polynomial time separation algorithm for these inequalities. As a consequence, we obtain a polynomial time cutting plane algorithm for the minimum (maximum) independent dominating set problem on a cycle. We also introduce a lifting operation called twin operation, and discuss some polyhedral consequences. In particular, we show that the above results can be extended to a more general class of graphs.