

### **Abstract**

Recently, Aguilera et al. exposed a beautiful relationship between antiblocker duality and the lift-and-project operator proposed by Balas et al. We present a very short proof of their result that the BCC-rank of the clique polytope is invariant under complementation. The proof of Aguilera et al. relies on their main technical result, which describes a stronger duality property of all intermediate relaxations. We provide a short proof of this result, too, using simpler and more general arguments. As a result, our theorems are slightly more general. We conclude by proving that such properties do not extend to the  $N_0$  and  $N$  procedures of Lovász and Schrijver, or to the  $N_+$  procedure unless  $\mathcal{P} = \mathcal{NP}$ .