On a new class of facet inducing inequalities for the correlation clustering problem

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In this paper we continue our polyhedral research for the correlation clustering problem [1]. Let $\mathbf{K}_n = (V, E)$ be a complete unoriented graph without loops and multipe edges. Spanning subgraph $H \subset \mathbf{K}_n$ is called M-graph if each of its connected components is a clique or single-vertex graph. We denote the set of all M-graphs in $\mathbf{K}_n$ through $\mu(V)$. Let $G \subset \mathbf{K}_n$ be some a priori set spanning subgraph. Correlation clustering problem consists in finding M-graph H minimizing the functional $\rho_G(H) = |EG \cup EH| - |EG \cap EH|$ on set $\mu(V)$. We present this problem as the problem of minimizing a linear functional on the convex hull of the incidence vectors of M-graphs. In this paper a new class of inequalities that induce the facets of a polytope of a problem are described, the separation problem for these inequalities are discussed.

References

1. Simanchev, R.Yu., Urazova, I.V.: On the polytope faces of the graph approximation problem. J. of Applied and Industrial Mathematics. 2015. Vol. 9(2) P. 283–291.