Two edge-disjoint hop-constrained paths and polyhedra

D. Huygens, A.R. Mahjoub and P. Pesneau

Abstract

The 2-edge-connected subgraph with bounded rings problem in a graph consists in determining a minimum cost 2-edge-connected subgraph such that the shortest cycle to which each edge belongs (a "ring") does not exceed a given length K. We present here a formulation of that problem in the space of the natural design variables and derive facet results for different classes of valid inequalities. We study the separation problems associated to these inequalities and their integration in a Branch-and-Cut algorithm, and provide extensive computational results.