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c-Sum Flows in Graphs

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Abstract

Let G be a graph. For a real number c, a *c-sum flow* of G is an assignment of non-zero real numbers to the edges of G such that the sum of values of all edges incident with each vertex is c. Let k be a natural number. A *c-sum k-flow* is a c-sum flow with values from the set $\{\pm 1, \ldots, \pm(k-1)\}$. In this talk, we present known results on c-sum k-flows of graphs and propose several conjectures.

The four-color theorem states that any map in a plane can be colored using four-colors in such a way that regions sharing a common boundary (other than a single point) do not share the same color. Nowhere-zero flows in directed graphs are important because they have nice relations with four color theorem. Here, we provide a bridge between nowhere-zero flows in directed graphs and 0-sum flows in undirected graphs.

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TÜRK MATEMATİK DERNEĞİ