

# Connectivity and decompositions of signed-graphic matroids

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**Abstract.** A signed graph is a pair  $(G, f)$  in which  $G$  is a graph and  $f$  is a labelling of the edges of  $G$  with elements of the multiplicative group  $(+, -)$ . A circle (i.e., simple closed path) in  $G$  is said to be negative when the product of signs on its edges is negative, otherwise the circle is said to be positive. A subgraph of a signed graph is called balanced when it does not contain any negative circles.

A signed-graphic matroid is a matroid whose elements may be considered as the edges of a signed graph  $(G, f)$  with rank function described as follows. If  $X$  is a collection of edges in  $(G, f)$  and  $G:X$  denotes the subgraph with edges  $X$  and no isolated vertices, then the rank of  $X$  is the number of vertices in  $G:X$  minus the number of balanced components in  $G:X$ .

In this talk we will describe how connectivity of a signed-graphic matroid is related to connectivity of its corresponding signed graph. Also, for  $k=1, 2,$  and  $3$  we will describe how exact  $k$ -separations of a signed-graphic matroid translate into separations of its signed graph.