Branchwidth of graphic matroids.

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A *branch-decomposition* of a graph $G = (V, E)$ is a ternary tree $\mathcal{T}$ and a bijection from the set of leaves of $\mathcal{T}$ into the set of edges of G. Every edge e of $\mathcal{T}$ partitions $\mathcal{T} \setminus e$ into two subtrees, and thus correspond to a bipartition (E_1, E_2) of E, called *e-separation*. The *width* of (E_1, E_2) is the number of vertices of G incident to an edge of E_1 and an edge of E_2. The *width* of $\mathcal{T}$ is the maximum width of an *e-separation*. Finally, the *branchwidth* of G is the minimum width of a branch-decomposition of G.

The notion of branchwidth extends naturally to matroids, branch-decompositions being ternary trees which set of leaves is the ground set of the matroid. Here the *width* of a separation (E_1, E_2) is $rk(E_1) + rk(E_2) - rk(E) + 1$, where rk is the rank function of the matroid.

Answering a question of Geelen, Gerards, Robertson and Whittle, we prove that the branchwidth of a bridgeless graph is equal to the branchwidth of its cycle matroid.

Our result directly implies that the branchwidth of a planar bridgeless graph is equal to the branchwidth of its dual. This property was first proved by Seymour and Thomas.