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ON PLANE RIGIDITY MATROIDS

Every connected cubic graph $H \neq K_4, K_{3,3}$ has an orientation without directed or alternating cycles. The current proof of this purely graph theoretic statement uses tropical geometry and matroid theory. The matroids in question are related to rigidity in $\mathbb{R}^2$ and naturally generalize the cycle matroid of K_n (forests/trees/cycles) to graphs with $2n-3$ edges. I will survey their remarkable properties and present some new ones.