PROJECTIVE ORIENTATIONS OF MATROIDS

by

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Abstract

Let $\mathbf{M}$ be a matroid on a finite set. Let $\mathcal{M}(\mathbf{M})$ denote the set of oriented matroids whose underlying matroid is $\mathbf{M}$. We define an equivalence relation on $\mathcal{M}(\mathbf{M})$ in terms of "reorientations" of oriented matroids. The set of reorientation classes of oriented matroids on $\mathbf{M}$ is characterized in various combinatorial and algebraic ways. As part of this work we find two presentations of the inner Tutte group of $\mathbf{M}$ by generators and relations.