Erde, Joshua; Gollin, J. Pascal; Joó, Attila; Knappe, Paul; Pitz, Max

Base partition for mixed families of finitary and cofinitary matroids. (English) Zbl 1474.05040

As motivation the authors claim to have recently proved that if an (infinite) graph admits a packing (trees are disjoint) and a covering (union is the entire edge set) both consisting of \(\lambda\) many spanning trees, where \(\lambda\) is some infinite cardinal, then the graph also admits a decomposition into \(\lambda\) many spanning trees. For a finite or infinite collection of matroids, all on the same ground set \(E\), \(M = (M_i, i \in K)\), where each of the \(M_i\) is either finitary (i.e. all cycles are finite) or co-finitary, the authors prove that if there is a collection of bases, one for each \(M_i\), which covers the set \(E\), and a collection of bases, again one for each \(M_i\), which are pairwise disjoint, then there is a collection of bases which partitions \(E\). To point out that this result does not hold for arbitrary matroids the authors show that, assuming the Continuum Hypothesis, there exists a countable matroid \(M\) such that the family consisting of two copies of \(M\) admits a base covering and a base packing, but no base partitioning. A short introduction to infinite matroids makes the paper self contained and readable.

Reviewer: Brigitte Servatius (Worcester)

MSC:
05B35 Combinatorial aspects of matroids and geometric lattices
05B40 Combinatorial aspects of packing and covering
05C63 Infinite graphs
03E35 Consistency and independence results
52B40 Matroids in convex geometry (realizations in the context of convex polytopes, convexity in combinatorial structures, etc.)

Keywords:
finitary matroids; co-finitary matroids; base covering; base partitioning; base packing; Zermelo-Fraenkel axioms

Full Text: DOI arXiv

References:


This reference list is based on information provided by the publisher or from digital mathematics libraries. Its items are heuristically matched to zbMATH identifiers and may contain data conversion errors. It attempts to reflect the references listed in the original paper as accurately as possible without claiming the completeness or perfect precision of the matching.