Fractional Perfect Matchings in Hypergraphs

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Abstract

A perfect matching in a k-uniform hypergraph $H = (V, E)$ on n vertices is a set of n/k disjoint edges of H, while a fractional perfect matching in H is a function $w : E \to [0, 1]$ such that for each $v \in V$ we have $\sum_{e \ni v} w(e) = 1$. Given $n \geq 3$ and $3 \leq k \leq n$, let m be the smallest integer such that whenever the minimum vertex degree in H satisfies $\delta(H) \geq m$ then H contains a perfect matching, and let m^* be defined analogously with respect to fractional perfect matchings. Clearly, $m^* \leq m$.

We prove that for large n, $m \sim m^*$, and suggest an approach to determine m^*, and consequently m, utilizing the Farkas Lemma.
This is a joint work with Vojta Rodl.