Perfect matchings in random sparsifications of Dirac hypergraphs

Vincent Pfenninger (University of Birmingham)

We show that, for $k \geq 3$ and n divisible by k, if a k-uniform hypergraph $\mathcal{H}$ on n vertices has large enough minimum $(k-1)$-degree to guarantee a perfect matching, then asymptotically almost surely a p-random subhypergraph of $\mathcal{H}$ also contains a perfect matching, provided that $p > C \log n / n^{k-1}$. Our result strengthens Johansson, Kahn, and Vu's seminal solution to Shamir's problem and can be viewed as a 'robust' version of a hypergraph Dirac-type result by Rödl, Ruciński, and Szemerédi.

This is joint work with Dong Yeap Kang, Tom Kelly, Daniela Kühn, and Deryk Osthus.