

Perfect matchings and loose Hamilton cycles in sparse pseudorandom hypergraphs

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We study the existence of perfect matchings and loose Hamilton cycles in sparse pseudorandom hypergraphs, as well as F -factors (i.e. vertex-disjoint copies of F covering all the vertices of the host graph), for linear hypergraphs F . Our notion of pseudorandomness is a quantitative version of weak quasirandomness and is a straightforward extension of the classical notion of jumbledness for graphs. In each case, we give explicit conditions on the parameters which control pseudorandomness, so that any hypergraph H satisfying such conditions, contains the desired spanning structure. Lenz and Mubayi (and Mycroft for the case of Hamilton cycles) showed that dense sufficiently quasirandom hypergraphs contain the structures considered and hence our work extends theirs by making the pseudorandom condition explicit and exploring the sparse setting. For the case of perfect matchings, where Lenz and Mubayi did consider the sparse setting, we provide a strengthening of their result by significantly weakening the condition on the pseudorandomness.

This is joint work with Hiệp Hàn and Jie Han.