

On Aharoni-Berger's conjecture of rainbow matchings
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Let G be a properly edge coloured multigraph with m colours and let $\mathcal{M} = \{M_1, \dots, M_m\}$ be the set of m matchings induced by each colour in G . Assume that every matching in \mathcal{M} has size n . Aharoni and Berger conjectured that if G is bipartite and $m = n - 1$ then G contains a full rainbow matching, i.e. a matching that contains exactly one edge from each M_i for each $1 \leq i \leq m$. We prove an approximate version of this conjecture. We show that if $m \leq n - n^c$, where $c > 9/10$, and G is simple whereas not necessarily bipartite, then G contains a rainbow matching if n is sufficiently large. Our proof proceeds by analysing a randomised algorithm.

This is collaborated work with Reshma Ramadurai, Ian Wanless and Nick Wormald