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On Kotzig's conjecture in random graphs

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On Kotzig's conjecture in random graphs

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Abstract

In 1963, Anton Kotzig famously conjectured that K_n , the complete graph of order n , where n is even, can be decomposed into $n - 1$ perfect matchings such that every pair of these matchings forms a Hamilton cycle. The problem is still wide open and here we consider a variant of it for the binomial random graph $G(n, p)$. In fact, our main result is a very precise answer for the following counting problem: given any k edge-disjoint perfect matchings M_1, \dots, M_k of K_n , how many perfect matchings M^* in K_n have the property that $M^* \cup M_i$ forms a Hamilton cycle for each $i \in [k]$? Joint work with Stefan Glock.