Zhang, Yi; Lu, Mei
d-matching in 3-uniform hypergraphs. (English) Zbl 1378.05175

Summary: A matching in a 3-uniform hypergraph is a set of pairwise disjoint edges. A d-matching in a 3-uniform hypergraph $H$ is a matching of size $d$. Let $V_1, V_2$ be a partition of $n$ vertices such that $|V_1| = 2d - 1$ and $|V_2| = n - 2d + 1$. Denote by $E_3(2d - 1, n - 2d + 1)$ the 3-uniform hypergraph with vertex set $V_1 \cup V_2$ consisting of all those edges which contain at least two vertices of $V_1$. Let $H$ be a 3-uniform hypergraph of order $n \geq 9d^2$ such that $\deg(u) + \deg(v) > 2 \left(\binom{n-1}{2} - \binom{n-d}{2}\right)$ for any two adjacent vertices $u, v \in V(H)$. In this paper, we prove $H$ contains a d-matching if and only if $H$ is not a subgraph of $E_3(2d - 1, n - 2d + 1)$.

MSC: 05C70 Edge subsets with special properties (factorization, matching, partitioning, covering and packing, etc.) 05C65 Hypergraphs

Keywords: matching; 3-uniform hypergraph; adjacent vertices

Full Text: DOI

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