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NEAR-PACKINGS OF GRAPHS WITH BOUNDED-DEGREE OVERLAP

A near-packing of a graph G is a permutation σ of its vertex set such that the common edges of G and its image $\sigma(G)$ form a graph belonging to a prescribed family $\mathcal{F}$. For a positive integer n and a family $\mathcal{F}$, let $m(n, \mathcal{F})$ denote the largest integer m such that every graph of order n and size at most m admits such a near-packing.

In this talk, we consider the families $\mathcal{D}_k$ of graphs with maximum degree at most k . The case $k = 0$ corresponds to classical graph packing and has been known for a long time, while the exact value of $m(n, \mathcal{D}_1)$ was determined only recently. We continue this line of research by studying the next natural case. In particular, we determine the asymptotic behaviour of $m(n, \mathcal{LF})$, where $\mathcal{LF}$ denotes the family of linear forests. As a consequence, we also obtain the asymptotic value of $m(n, \mathcal{D}_2)$.