Size-Ramsey numbers of graphs with maximum degree three

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The size-Ramsey number $\hat{r}(H)$ of a graph H is the smallest number of edges a (host) graph G can have, such that for any red/blue coloring of G, there is a monochromatic copy of H in G. Recently, Conlon, Nenadov and Trujić showed that if H is a graph on n vertices and maximum degree three, then $\hat{r}(H) = O(n^{8/5})$, improving upon the bound of $n^{5/3+o(1)}$ by Kohayakawa, Rödl, Schacht and Szemerédi. In our paper, we show that $\hat{r}(H) \leq n^{3/2+o(1)}$. While the previously used host graphs were vanilla binomial random graphs, we prove our result by using a novel host graph construction. We also discuss why our bound hits a natural barrier of the existing methods. This is joint work with Kalina Petrova.