Sharp upper bounds for the minimum number of components of 2-factors in claw-free graphs

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(joint work with Daniel Paulusma and Kiyoshi Yoshimoto)

We first note that for claw-free graphs on n vertices with minimum degree $\delta = 2$ or $\delta = 3$ that have a 2-factor we can not do better than the trivial upper bound $n/3$ on the number of components of a 2-factor. Hence, in order to get a nontrivial result it is natural to consider claw-free graphs with $\delta \geq 4$. Let G be a non-hamiltonian claw-free graph on n vertices with minimum degree δ. We prove the following results, thereby improving known results due to Faudree et al. and to Gould & Jacobson. If $\delta = 4$, then G has a 2-factor with at most $(5n-14)/18$ components, unless G belongs to a finite class of exceptional graphs. If $\delta \geq 5$, then G has a 2-factor with at most $(n-3)/(\delta-1)$ components. These bounds are best possible in the sense that we cannot replace $5/18$ by a smaller quotient and we cannot replace $\delta - 1$ by δ.

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