

FACTORS IN PSEUDORANDOM GRAPHS

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ABSTRACT. An (n, d, λ) -graph is an n -vertex d -regular graph, whose second largest eigenvalue in absolute value is at most λ . We study clique-factors and 2-factors in (n, d, λ) -graphs G . Our results are:

- (1) if $\lambda \leq \frac{1}{50t4^{t-2}} \frac{d^{t-1}}{n^{t-2}}$ and n large, then G contains vertex-disjoint copies of K_t which cover all but at most $n^{1-1/(8t^4)}$ vertices of G . For $t = 3$ this provides further support for the conjecture of Krivelevich, Sudakov and Szabó, that $\lambda = o(d^2/n)$ implies a K_3 -factor;
- (2) if $\lambda \leq cd^t/n^{t-1}$ (for some absolute $c > 0$) then G contains a K_t -factor;
- (3) if $\lambda \leq cd^2/(n \ln n)$ (for some absolute $c > 0$) then G contains any 2-factor. This answers a recent question of Nenadov.

Our results can also be proven for 'appropriate' bijumbled graphs whose minimum degree is a positive proportion of its average degree. Joint work with Jie Han, Yoshiharu Kohayakawa and Patrick Morris.

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