

POWERS OF HAMILTONIAN CYCLES IN UNIFORMLY DENSE AND INSEPARABLE GRAPHS

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ABSTRACT. We consider sufficient conditions for the existence of k -th powers of Hamiltonian cycles in n -vertex graphs G with minimum degree μn for arbitrarily small $\mu > 0$. About 20 years ago Komlós, Sárközy, and Szemerédi resolved the conjectures of Pósa and Seymour and obtained optimal minimum degree conditions for this problem by showing that $\mu = \frac{k}{k+1}$ suffices for large n . Consequently, for smaller values of μ the given graph G must satisfy additional assumptions. We show that inducing subgraphs of density $d > 0$ on linear subsets of vertices and being inseparable, in the sense that every cut has density at least $\mu > 0$, are sufficient assumptions for this problem. This generalises a recent result of Staden and Treglown.