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Large subgraphs of minimal density or degree. (In English)

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Authors' abstract: This paper addresses the following questions. In any graph G with at least $\alpha\binom{n}{2}$ edges, how large of an induced subgraph H can we guarantee the existence of with minimum degree $\delta(H) \geq \lfloor \alpha|V(H)| \rfloor$? In any graph G with at least $\alpha\binom{n}{2} - f(n)$ edges, where $f(n)$ is an increasing function of n, how large of an induced subgraph H can we guarantee the existence of containing at least $\alpha\binom{|V(H)|}{2}$ edges? In any graph G with at least αn^2 edges, how large of an induced subgraph H can we guarantee the existence of with at least $\alpha|V(H)|^2 + \Omega(n)$ edges? For $\alpha = 1 - \frac{1}{r}$ for $r = 2, 3, \ldots$, the answer is zero since if G is a complete r-partite graph, no subgraph H of G has more than $\alpha|V(H)|^2$ edges. However, we show that for all admissible α except these, the answer is $\Omega(n)$. In any graph G with minimum degree $\delta(G) \geq \alpha n - f(n)$, where $f(n) = o(n)$, how large of an induced subgraph H can we guarantee the existence of with minimum degree $\delta(H) \geq \alpha|V(H)|$?

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05C35 Extremal problems (graph theory)

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