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Counting spanning subgraphs in dense hypergraphs

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Abstract

We give a simple method to estimate the number of distinct copies of some classes of spanning subgraphs in hypergraphs with high minimum degree. In particular, for each $k \geq 2$ and $1 \leq \ell \leq k-1$, we show that every k-graph on n vertices with minimum codegree at least

$$\begin{cases} \left(\frac{1}{2} + o(1)\right) n & \text{if } (k-\ell) \mid k, \\ \left(\frac{1}{\lceil \frac{k}{k-\ell} \rceil (k-\ell)} + o(1)\right) n & \text{if } (k-\ell) \nmid k, \end{cases}$$

contains $\exp(n \log n - \Theta(n))$ Hamilton ℓ-cycles as long as $(k-\ell) \mid n$. When $(k-\ell) \mid k$ this gives a simple proof of a result of Glock, Gould, Joos, Kühn and Osthus, while, when $(k-\ell) \nmid k$ this gives a weaker count than that given by Ferber, Hardiman and Mond or, when $\ell < k/2$, by Ferber, Krivelevich and Sudakov, but one that holds for an asymptotically optimal minimum codegree bound.

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