

Graphs having small number of sizes on induced k - subgraphs.
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Let G be a graph on n vertices, k, ℓ are integers such that $2\ell \leq k \leq n - 2\ell$, n is large enough. Let

$$\nu_k(G) = |\{ |E(H)| : H \text{ is an induced subgraph of } G \text{ on } k \text{ vertices} \}|.$$

We show that if $\nu_k(G) \leq \ell$ then G has a complete or an empty subgraph on at least $n - \ell + 1$ vertices, and a homogeneous set of order at least $n - 2\ell + 2$. This extends the results by Bollobas et al. on the structure of graph with small number of nonisomorphic subgraphs provides a "reconstruction" interpretation.