

DEGENERATE VERTEX CUTS IN SPARSE GRAPHS

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For a non-negative integer k , a vertex cut in a graph is k -degenerate if it induces a k -degenerate subgraph. We show that a graph of order n at least $2k + 2$ without a k -degenerate cut has the size at least $\frac{1}{2} \left(k + \Omega(\sqrt{k}) \right) n$ and that a graph of order n at least 5 without a 2-degenerate cut has the size at least $\frac{27n-35}{10}$. For $k \geq 2$, we show that a connected graph G of order n at least $k + 6$ and size m at most $\frac{k+3}{2}n + \frac{k-1}{2}$ has a minimum k -degenerate cut.

References

- [1] T. Hartel, J. Rauch, D. Rautenbach, Degenerate Vertex Cuts in Sparse Graphs (2025), <https://arxiv.org/abs/2512.21298>