

# Matching and edge-connectivity in graphs with given maximum degree

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## Abstract

In this talk, we determine tight lower bound on the matching number of a graph with given maximum degree and edge-connectivity in terms of its order and size. For a graph  $G$  of order  $n$ , size  $m$ , matching number  $\alpha'(G)$ , edge-connectivity  $\lambda(G) \geq \lambda \geq 1$  and maximum degree  $k \geq \lambda$  we determine best possible constants  $a_{k,\lambda}$ ,  $b_{k,\lambda}$  and  $c_{k,\lambda}$  (depending only on  $k$  and  $\lambda$ ) such that  $\alpha'(G) \geq a_{k,\lambda} \cdot n + b_{k,\lambda} \cdot m - c_{k,\lambda}$ . Further if  $k$  and  $\lambda$  have different parities, we determine best possible constants  $d_{k,\lambda}$ ,  $e_{k,\lambda}$  and  $f_{k,\lambda}$  (depending only on  $k$  and  $\lambda$ ) such that  $\alpha'(G) \geq d_{k,\lambda} \cdot m - e_{k,\lambda} \cdot n - f_{k,\lambda}$ . We also show that  $\alpha'(G) \geq n - \frac{1}{\lambda}m$  unless  $\alpha'(G) = \frac{1}{2}(n-1)$  in which case  $\alpha'(G) \geq n - \frac{1}{\lambda}m - \frac{1}{2}$ . We prove that the above bounds are tight for essentially all densities of graphs.

## References

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