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On the Wiener Index of Graphs with Large Maximum Degree

The Wiener index $W(G)$ of a connected graph G is defined as the sum of the distances between all unordered pairs of vertices of G .

Best possible upper bounds on the Wiener index in terms of order and either minimum degree or maximum degree were given by Kouider and Winkler, and Plesnik, respectively. In this talk we combine these bounds. Among others, we prove the best possible bound

$$W(G) \leq \binom{n - \Delta + \delta}{2} \frac{n + 2\Delta}{\delta + 1} + O(n^2),$$

for graphs of order n , minimum degree δ and maximum degree Δ .

Joint work with Alex Alochukwu.