

# Partition distance in graphs

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If  $G$  is a graph and  $\mathcal{P}$  is a partition of  $V(G)$ , then the partition distance of  $G$  is the sum of the distance between all pairs of vertices that lie in the same part of  $\mathcal{P}$ . This concept generalizes several metric concepts (such as the (terminal) Wiener index). It will be demonstrated that the partition distance of a graph can be obtained from the Wiener index of weighted quotient graphs induced by the transitive closure of the Djoković-Winkler relation as well as by any partition coarser than it. Many earlier results follow from the obtained theorems. Applying the main results, upper bounds on the partition distance of trees with prescribed order and radius will also be shown and corresponding extremal trees presented.

## References

- [1] S. Klavžar and M. J. Nadjafi-Arani, Partition distance in graphs, *J. Math. Chem.* **56** (2018), 69–80.