

The Wiener Ratio for Embedded Graphs

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The Wiener index of a graph is the sum of all distances between pairs of vertices. For a graph G embedded in a surface, we consider the ratio formed between the Wiener index of G and the Wiener index of its dual, taking the reciprocal, if necessary, to ensure the ratio is in $[0,1]$. We explore the Wiener ratio for various one and two-parameter families of embedded graphs, obtaining a density result for $(1/8,1)$ and demonstrating how to use a voltage graph construction to bound the limiting value of the Wiener ratios of a one-parameter family.

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