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Summary: Let \( G \) be a simple graph with \( n \) vertices and let
\[
C(G; x) = \sum_{k=0}^{n} (-1)^{n-k} c(G,k) x^k
\]
denote the Laplacian characteristic polynomial of \( G \). Then if the size \( |E(G)| \) is large compared to the maximum degree \( \Delta(G) \), Laplacian coefficients \( c(G,k) \) are approximately normally distributed (by central and local limit theorems). We show that Laplacian coefficients of the paths, the cycles, the stars, the wheels and regular graphs of degree \( d \) are approximately normally distributed respectively. We also point out that Laplacian coefficients of the complete graphs and the complete bipartite graphs are approximately Poisson distributed respectively.

MSC:
05C31 Graph polynomials
05C07 Vertex degrees

Keywords:
Laplacian matrix; Laplacian coefficient; asymptotic normality; central limit theorem; local limit theorem

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