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On the spectral radius of the maximum degree matrix of graphs

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Abstract

Let $G_{n,d}$ be the set of simple connected graphs with n vertices and diameter d. A graph in $G_{n,d}$ that attains the largest spectral radius of the maximum degree matrix is called a maximizing graph. In this paper, we characterize the spectrum of the maximum degree matrix for graphs of the form $B_{n-i+2,i,d-i}$, where $1 \leq i \leq \lfloor \frac{d}{2} \rfloor$. For $d \geq 2$, we prove that the maximizing graph in $G_{n,d}$ is $B_{n-d+2,\lfloor \frac{d}{2} \rfloor,\lceil \frac{d}{2} \rceil}$. Finally, if $d \geq 4$ is an even integer, then the spectral radius of the maximum degree matrix of $B_{n-d+2,\lfloor \frac{d}{2} \rfloor,\lceil \frac{d}{2} \rceil}$ can be computed as the largest eigenvalue of a symmetric tridiagonal matrix of order $\frac{d}{2}+1$ [1].

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References

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