On the eigensharp and almost eigensharp graphs

E. Ghorbani[a] H. R. Maimani[a,b]
[a] Department of Mathematics, Shahid Rajaee University (SRU), Tehran,Iran
[b] Institute for Studies in Theoretical Physics and Mathematics(IPM)
P. O. Box 19395-5749, Tehran, Iran

The minimum number of complete bipartite subgraphs needed to partition the edges of a graph G is denoted by $b(G)$. known lower bound on $b(G)$ is at least the maximum of the number of positive and negative eigenvalues of the adjacency matrix A of G; that is $b(G) \geq max\{n_+(G), n_-(G)\}$. When the equality is attained G is said to be eigensharp . Eigensharp graphs include complete graphs, trees, cycle C_n with $n \neq 4k$, mobius ladder M_n with $n = 3$ or $n \neq 4k$, and some cartesian products of cycles. Also the complement of every path is eigensharp.

In this paper we prove that n-cube Q_n (n is odd), wheels W_n ($n = 5$ or $n \neq 4k + 1$), $W_n - M$(M is a maximal matching) , and some products of some graphs are eigensharp. Also we introduced the concept of almost eigensharp graph (graphs with $b(G) = (\{n_+(G), n_-(G)\} + 1)$, and study these collection of graphs.

References

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