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Distinct Spectra and Interlacing in Hollow Graphs

Historically, the characteristic polynomial has primarily been the object used to derive spectral information about a graph; however, the *weighted matching polynomial*, denoted by $m_w(G, x)$ has recently been a topic of interest. It is well known that the roots of the weighted matching polynomial enjoy an interlacing property with respect to a vertex-deleted subgraph. A natural question is "for which graphs G does strict interlacing hold among the roots of roots of $m_w(G, x)$ and $m_w(G\backslash\{v\}, x)$?" A classical example of such a graph is one that contains a Hamilton path. In this talk, we generalize this notion to establish a new class of graphs called SRSI_w graphs and characterize them by providing a construction using a simple graph expansion operation.