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Determining Distinctness in the Weighted Matching Polynomial

It is well known that the roots of any weighted matching polynomial of a graph with a Hamilton path are distinct, real numbers that enjoy a strict interlacing property with respect to the end-points of the Hamilton path. In this talk, we generalize this notion to establish a new class of graphs called SRSI_w graphs. These graphs have simple roots where the roots of a vertex-deleted subgraph strictly interlace the roots of the graph. In this talk, we characterize all SRSI_w graphs and provide a construction using a simple graph expansion operation.