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Weakly Hadamard Diagonalizable Graphs

An interesting question in the spectral graph theory is about the structure of the eigenvectors of matrices associated with graphs. A graph is *weakly Hadamard diagonalizable (WHD)* if its Laplacian matrix L can be diagonalized with a weakly Hadamard matrix. In other words, if $L = PDP^{-1}$, where D is a diagonal matrix and P has the property that all entries in P are from $\{0, -1, 1\}$ and that $P^t P$ is a tridiagonal matrix. In this talk, I will present some necessary and sufficient conditions for a graph to be WHD. Also some families of graphs which are WHD, will be presented.

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