

Cospectral graphs for the normalized Laplacian by “toggling”

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A characteristic of the normalized Laplacian matrix is the possibility for cospectral graphs which do not have the same number of edges. We give a construction of an infinite family of weighted graphs that are pairwise cospectral and which can be transformed into simple graphs. In particular, some of these graphs are cospectral with subgraphs of themselves. In the proof we deconstruct these graphs into generalized cycles and consider the characteristic polynomials.

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