

A Spanning Tree-Reducing Surgery and Partial Factor Majorization

John T. Saccoman, Seton Hall University

A graph G is a threshold graph if, for all pairs of nodes u and v in G , the neighborhood of u excluding v is completely contained in the neighborhood of v excluding u whenever $\deg(u) \leq \deg(v)$. It is known that threshold graphs provide the best lower bound on the number of spanning trees and all-terminal reliability for graphs in a particular class. There exist surgeries that lower these invariants for certain threshold graphs, but they do not work in all cases. We present a new surgery that will transform a threshold graph with minimum degree of 2 or greater, meeting other conditions, to a threshold graph with a lower number of spanning trees. In doing so we apply a majorization technique to the graphs' respective Temperley's B-matrix eigenvalues.

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