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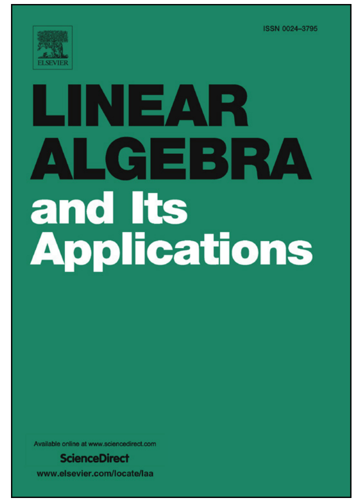

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Abstract

Let $G = (V, E)$ be a simple graph of order n and size m, with vertex set $V(G) = \{v_1, v_2, \ldots, v_n\}$, without isolated vertices and sequence of vertex degrees $\Delta = d_1 \geq d_2 \geq \cdots \geq d_n = \delta > 0$, $d_i = d_G(v_i)$. If the vertices v_i and v_j are adjacent, we denote it as $v_iv_j \in E(G)$ or $i \sim j$. With TI we denote a topological index that can be represented as $TI = TI(G) = \sum_{i\sim j} \mathcal{F}(d_i, d_j)$, where $\mathcal{F}$ is an appropriately chosen function with the property $\mathcal{F}(x, y) = \mathcal{F}(y, x)$. A general extended adjacency matrix $A = (a_{ij})$ of G is defined as $a_{ij} = \mathcal{F}(d_i, d_j)$ if the vertices v_i and v_j are adjacent, and $a_{ij} = 0$ otherwise. Denote by f_i, $i = 1, 2, \ldots, n$ the eigenvalues of A. The "energy" of the general extended adjacency matrix is defined as $\mathcal{E}_{TI} = \mathcal{E}_{TI}(G) = \sum_{i=1}^{n} |f_i|$. Lower and upper bounds on $\mathcal{E}_{TI}$ are obtained. By means of the present approach a plethora of earlier established results can be obtained as special cases.

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