Eccentricity energy change of coalescence of graphs due to edge deletion

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Abstract

The eccentricity matrix of a graph is obtained from the distance matrix by keeping the largest entries in their row or column, and the remaining entries are replaced by zeros. The eccentricity energy of a graph is the sum of the absolute values of the eigenvalues of its eccentricity matrix. In this paper, we investigate the effect of edge deletion on the eccentricity energy of graphs of the form

$$G = K_{2n} \circ_n K_{2n} \circ_n \cdots \circ_n K_{2n}, (l \text{ copies of } K_{2n}),$$

where $n \geq 3$, $l \geq 2$, and $\circ_n$ denotes the $n-$coalescence of graphs, and prove that the eccentricity energy increases whenever an edge is removed. This result identifies a class of graphs whose eccentricity energy exhibits monotonic growth under edge deletion.
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