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A CHARACTERIZATION OF SINGULAR GRAPHS*

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Abstract. Characterization of singular graphs can be reduced to the non-trivial solutions of a system of linear homogeneous equations $\mathbf{Ax} = \mathbf{0}$ for the 0-1 adjacency matrix $\mathbf{A}$. A graph G is singular of nullity $\eta(G) \geq 1$, if the dimension of the nullspace $\ker(\mathbf{A})$ of its adjacency matrix $\mathbf{A}$ is $\eta(G)$. Necessary and sufficient conditions are determined for a graph to be singular in terms of admissible induced subgraphs.

Key words. Adjacency matrix, Eigenvalues, Singular graphs, Core, Periphery, Singular configuration, Minimal configuration.

AMS subject classifications. 05C50, 05C60, 05B20.

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