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A VARIANT ON THE GRAPH PARAMETERS OF COLIN DE VERDIÈRE: IMPLICATIONS TO THE MINIMUM RANK OF GRAPHS[*]

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Abstract. For a given undirected graph G, the minimum rank of G is defined to be the smallest possible rank over all real symmetric matrices A whose (i, j)th entry is nonzero whenever $i \neq j$ and $\{i, j\}$ is an edge in G. Building upon recent work involving maximal coranks (or nullities) of certain symmetric matrices associated with a graph, a new parameter ξ is introduced that is based on the corank of a different but related class of symmetric matrices. For this new parameter some properties analogous to the ones possessed by the existing parameters are verified. In addition, an attempt is made to apply these properties associated with ξ to learn more about the minimum rank of graphs – the original motivation.

Key words. Graphs, Minimum rank, Graph minor, Corank, Strong Arnold property, Symmetric matrices.

AMS subject classifications. 15A18, 05C50.

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