

Some Relations Between Term Rank and Chromatic Number of a Graph

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Let G be a graph with nonempty edge set, we denote the rank of the adjacency matrix of G and term rank of G , by $\text{rk}(G)$ and $\text{Rk}(G)$, respectively. C. van Nuffelen conjectured that for any graph G , $\chi(G) \leq \text{rk}(G)$. The first counterexample to this conjecture was obtained by Alon and Seymour. In 2002, Fishkind and Kotlov have proved that for any graph G , $\chi(G) \leq \text{Rk}(G)$. In this paper we improve Fishkind-Kotlov upper bound and show that $\chi(G) \leq \frac{\text{rk}(G) + \text{Rk}(G)}{2}$. Moreover, we generalize their result to the list chromatic number of G .