An extremal problem for minimally k-connected graphs

Haiying Wang, Bing Wei, Haidong Wu, Yingze Zhao*, University of Mississippi

Let k be a positive integer. A graph is minimally k-connected if it is k-connected, but for each edge e of G, the deletion of e from G is not k-connected. A classical result of Mader states that every minimally k-connected graph contains at least $\Delta(G)$ vertices of degree k, where $\Delta(G)$ is the maximum degree of G. In this paper, for $k = 3, 4$, we characterize all minimally k-connected graphs G having exactly $\Delta(G)$ vertices of degree k. Our results give a complete description of the extremal graphs attaining Mader's bound in these two cases.

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