HU ZHANG, McMaster University, 1280 Main Street West, Hamilton, ON, L8S 4K1
Minimizing the Number of Critical Vertices in Network Design

Given a weighted complete graph $G_K(V, E_K)$, we study a network design problem to find an edge set $E \subseteq E_K$ such that the graph $G(V, E)$ is connected. The power of a vertex u in G is the maximum weight of the edges in E incident with it. Minimizing the maximum vertex power is polynomial time solvable, while minimizing the number of critical vertices with this minimized maximum vertex power is NP-hard. For any fixed $\epsilon > 0$ we present a $(3/2 + \epsilon)$-approximation algorithm for the latter problem, and show that this ratio is tight.